FLIGHT and AIRCRAFT ENGINEER

First Aeronautical Weekly in the World

Founded 1909

No. 2119. Vol. LVI. THURSDAY, 4 AUGUST, 1949

EDITORIAL DIRECTOR
G. GEOFFREY SMITH, M.B.E.

EDITOR
MAURICE A. SMITH, D.F.C.

ASSISTANT EDITOR
H. F. KING, M.B.E.

ART EDITOR
JOHN YOXALL

Editorial, Advertising and Publishing Offices :

DORSET HOUSE,
STAMFORD STREET,
LONDON, S.E.1.

Telegrams : Flightpres, Sedist, London.
Telephone : Waterloo 3333 (60 lines).

Branch Offices :

COVENTRY
8-10, Corporation Street.
Telegrams : Autocar, Coventry.
Telephone : Coventry 5210.

BIRMINGHAM, 2.
King Edward House,
New Street.
Telegrams : Autopress, Birmingham.
Telephone : Midland 7191 (7 lines).

MANCHESTER, 3
260, Deansgate.
Telegrams : Iliffe, Manchester.
Telephone : Blackfriars 4412 (3 lines). Deansgate 3595 (2 lines).

GLASGOW, C.2
26b, Renfield Street.
Telegrams : Iliffe, Glasgow.
Telephone : Central 4857.

SUBSCRIPTION RATES

Home : Twelve months, £3 1s. 0d. Six months, £1 10s. 6d.
Overseas : Twelve months, £2 18s. 6d.

BY AIR : To any country in Europe (except Poland). Twelve months, £5 1s. 0d. Six months, £2 10s. 6d. Canada and U.S.A. Six months, $16.

In this issue:

A Princess Advances - 118
Comet in the Sky - 120
American Notebook - 124
Bush Flying in Manitoba 128
The National Races - 131
Introduction to Spain - 135

Confidence at Cowes

OF the nations which have built and operated flying boats, Great Britain alone remains in the running for the commercial rewards offered, in our opinion, by this class of aircraft. When the hull of the first Saro Princess was moved at Cowes last week—an undertaking comparable with the launching of a ship and her transference to the fitting-out basin—Sir Arthur Gouge declared his unshaken faith in these great craft. In the three years since they were planned, civil-aircraft design has nowhere strode farther ahead than in this country : within only two days of the Princess's move the pure-jet D.H. Comet—an airliner totally different in concept, though likewise intended for trans-oceanic service—had flown, and the implications of this great event were everywhere being discussed.

How often, on learning of important developments in rival camps, the Saro technicians, under Mr. Knowler, have searched their hearts and re-checked their figures, we do not know ; but that their confidence in their majestic brain-children increases as the hulls take form is evident to anyone lucky enough to visit the Medina factory. Less happy are their colleagues in France's Sud-Est works near Marseilles who, having developed a piloted scale-model of a very fast Python-powered boat, approaching the Princess in size, have been notified that there are no funds for building even one full-scale example.

Meanwhile, very real advances in hydrodynamic design are observed in America, though as yet these are being applied only to military types. Visitors to the States report re-awakening interest in large commercial flying boats.

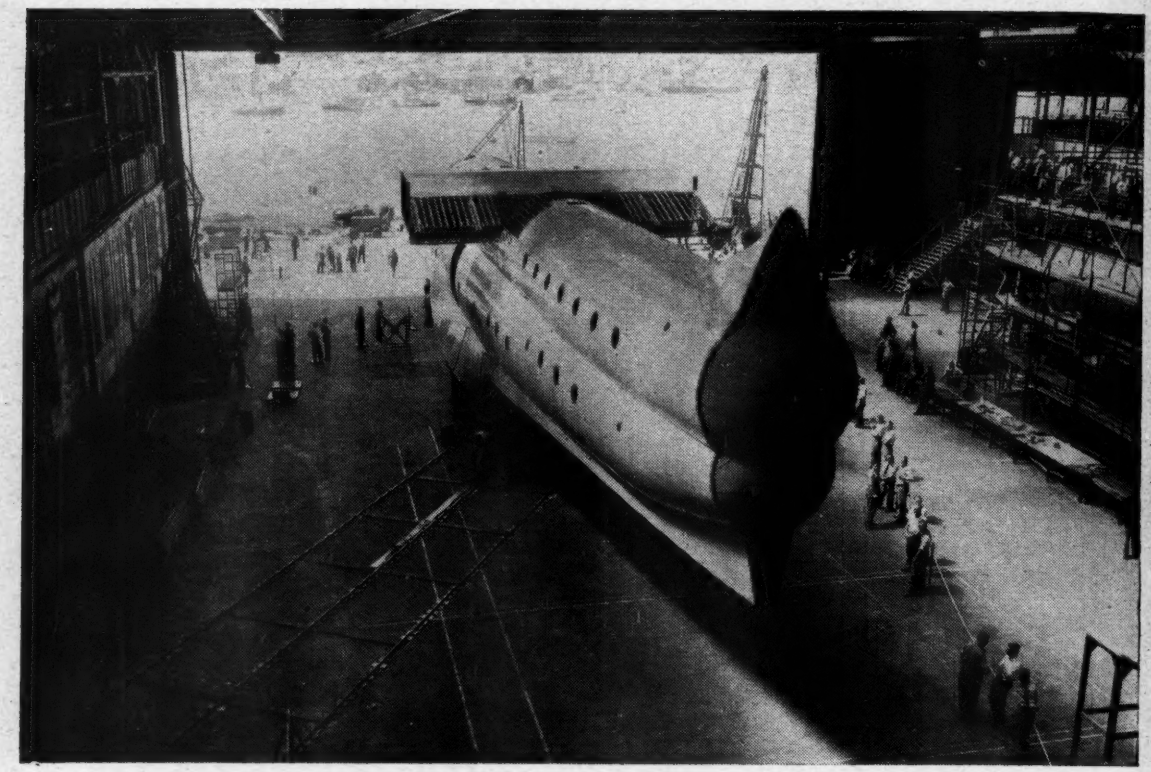
Though we in Britain may have missed an important step in not exploiting the commercial qualities of the Short-Saro Shetland, the Princesses will assure the continuance of our lead in marine aircraft construction.

From Another Point of View

IT is seldom that we refer to the aircraft manufacturing industry from a purely financial viewpoint, and it is probable that the majority of those actively engaged in the profession of aviation have little enough time, or even inclination, to probe into balance-sheets or shake their heads over dividends. Once in a while, however, some considered opinions from the City, particularly when they are of an encouraging nature, justify their inclusion in this journal.

Recently the *Financial Times* found occasion to discuss aircraft shares, commencing: "Few industries can confidently forecast increased turnover and profits during the next few years, but aircraft manufacture is among those which come nearest to that enviable state. . . ." At this point important, if obvious, qualifications are made, namely, that a design error, failure to judge the requirements of a market or to keep abreast of technical progress might at any time involve a company in heavy loss. These remarks apply to almost any industry, but it is true that in few trades are heavier penalties exacted for single errors of judgment. It is also true that in few trades is it more difficult to predict requirements or is there keener technical competition. Moreover, it is seldom necessary in other trades for a company to commit itself to the same extent and so far in advance. British manufacturers have shown great courage and foresight, and their present vitality results to a very great extent from these qualities and from enterprise and individuality.

The comment continues: "The post-war period has not brought the heavy slump in orders at one time feared . . . none of the aircraft manufacturers has actually suffered loss. . . . Nor have the heavy expenditures incurred in developing new military and civil types of aircraft engines seriously embarrassed any company." There are exceptions to the second statement, but they may be regarded as special cases. This condition, very satisfactory in itself, may continue only so long as there is a demand for military aircraft. Fortunately important future contracts are also assured by Britain's lead in gas turbine technique, and the recent appearance of several advanced civil transports. Such products as these will also enhance our position in the export market. The target figure for this year—£35 million—is likely to be attained.



A PRINCESS ADVANCES

Moving the Hull of the First 140-ton Saro for New Constructional Steps

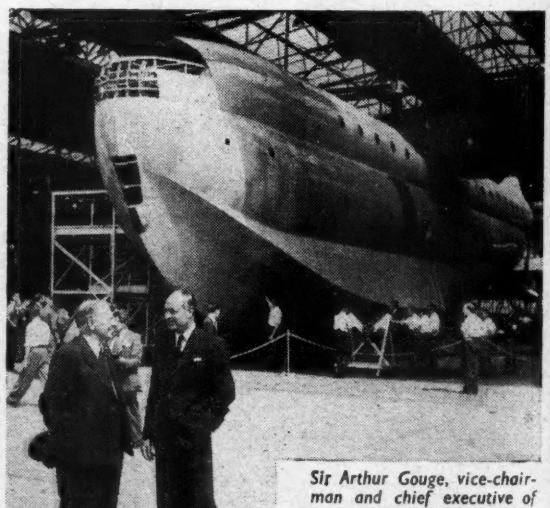
Illustrated by "Flight" photographs

ON the occasion, last Tuesday week, of withdrawing the first Princess Class flying-boat hull from its building stocks, to allow erection to proceed, Sir Arthur Gouge, vice-chairman and chief executive of Saunders-Roe, Ltd., summed up progress with these 140-ton double-deckers for B.O.A.C. The first Princess—"the world's largest practical flying boat," as he described it—was being moved, as near as made no difference, at the time envisaged eighteen months ago.

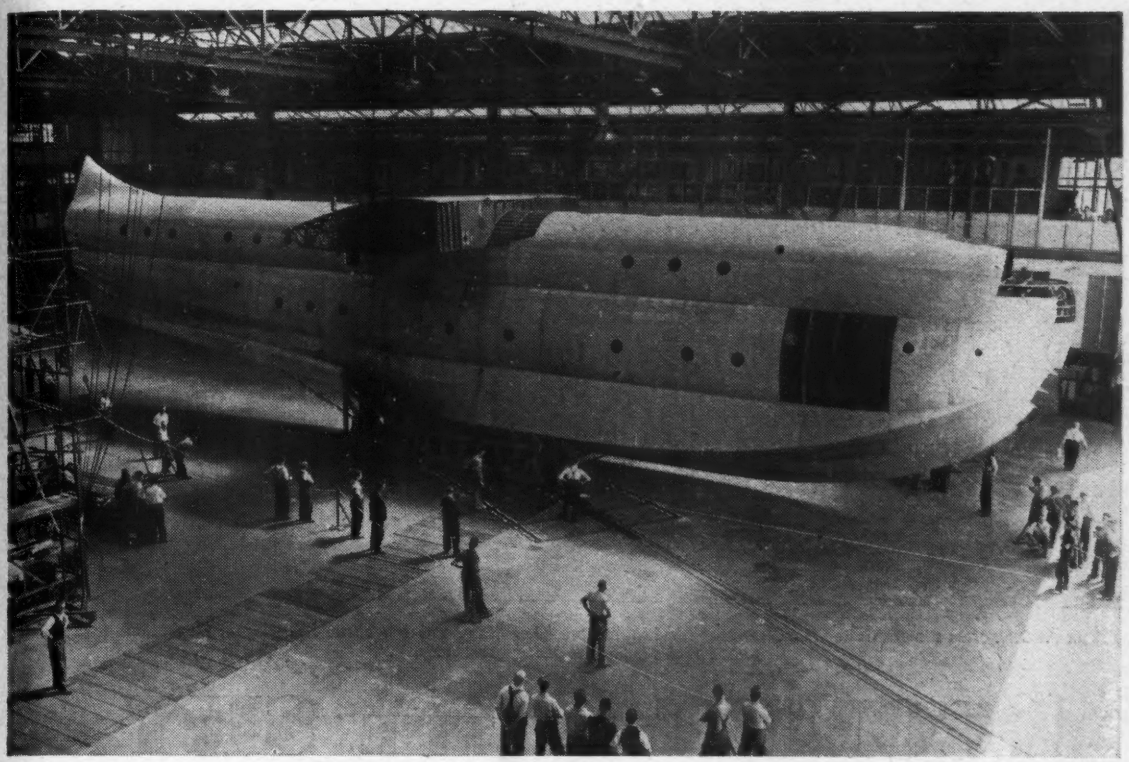
Sir Arthur is emphatic that Saunders-Roe have more than faith in these craft—they have knowledge. The engines are in sight of being ready and the first launching date can almost be foretold. During the three years since the Class was planned, nothing has shaken the faith of the firm and Sir Arthur is confident that, irrespective of class, these great boats will put Great Britain in the forefront of long-range aircraft development.

The substance behind these pronouncements can be seen by anyone fortunate enough to be afloat off Saro's enviably situated Medina works. Until recently, No. 1 hull, as seen from the river through the open doors of the erecting shop, was in its stocks on the right-hand side, with hull No. 2 (only four or five months behind, in terms of structural completeness) and No. 3 (some ten months behind), lying parallel on the opposite side. The first hull having been largely built, and having the wing centre-section, but not the rear body and tail unit, in place, it was transferred last Tuesday week to the centre of the shop for the fitting of the inner wings (housing the ten Bristol Proteus turboprops), the after-end of the hull, and the main tail-unit assembly. Even now, little enough room appears to be available for these major undertakings.

Finally, the aircraft will be moved into the open for the attachment of the outer planes and the tip of the fin, prior to being launched, it is hoped, towards the end of next



Sir Arthur Gouge, vice-chairman and chief executive of Saunders-Roe (left) and Mr. Henry Knowler, chief designer, well content with the progress of the move of Princess hull No. 1.



The first Princess hull, seen last Tuesday week after its 90-ft inch-by-inch move across the floor of the main Saro erection shop at Cowes. Sufficient room is now available for the inner wings (with Proteus turboprop units), the after hull section and the tail (less fin tip) to be added. Tractive power for the move was provided by six men on a hand-winch.

year. To permit engine runs ashore, the Princess will be positioned to face the hangar and will slide into the water, stern-first, down a new slipway.

As might have been expected, Tuesday's move was a very business-like affair. Cleared of scaffolding, the hull was seen to be resting on a sturdy cradle, extending between frames 19 and 30, and running on diagonal rails which would guide it to the desired position, 90 feet distant. This 8½-ton cradle, moreover, allowed the hull to be weighed and the centre of gravity to be determined. Four Saro stalwarts set-to on a hand-winch and the towering hull, weighing 16½ tons, was inched into place. Under Mr. H. Winkworth, works manager, the Saro staff concerned are to be congratulated on the manner in which they addressed their task.

Technical information concerning the Princess Class having been disseminated piecemeal, it may be useful here to refer to salient characteristics and to add the very latest data quoted by the makers. The hull is claimed to be the largest metal structure ever built for an aircraft, and the Saro technicians have calculated that its cubic capacity is equal to three and a half Constellations. Two and a half miles of longitudinal members, 1,469 sq yd of metal plating and three million rivets have gone into its making and the internal differential pressure of 8 lb/sq in amounts to 2,900 tons over the whole area. A full-scale hull section, built into concrete end-walls weighing 50 tons each, has already been subjected to an overload proof pressure of 16 lb/sq in and has met A.R.B. requirements.

Though unusually comfortable accommodation will be provided for up to 105 passengers, the number will, in practice, depend upon the service to be operated. It will be recalled that the Princess is designed to maintain a non-stop service between London and New York, with its stage length of 3,450 miles, in face of continuous head-winds averaging up to 90 m.p.h.

Notwithstanding the weight-saving effected by adopting tip retraction for the lateral stabilizing floats (formerly the floats were housed in the wing structure), the calculated gross weight has now risen to 315,000 lb, or approximately 140 tons. Even so, the power/weight ratio has remained more or less constant at 9 lb/h.p. The mark of Bristol Proteus turboprop to be standardized in the Princesses, in the form in which they will be operated, delivers 3,500 h.p., and will allow a cruising speed of 380 m.p.h. at 40,000 ft. At this speed, the requirements of the London-New York non-stop service (a still-air range of more than 5,500 miles) will be met. Four integral wing tanks will contain 14,500 gallons of usable paraffin. De Havilland constant speed, quick-feathering airscrews, 16½ ft in diameter, are specified.

The change in the method of float retraction has not affected the span, which remains at 219 ft 6 in. The hull length is now quoted as 148 ft, the height as 55 ft 9 in, and the beam as 16 ft 8 in.

ASSOCIATED ILIFFE TECHNICAL BOOKS

GAS TURBINES AND JET PROPULSION FOR AIRCRAFT by G. Geoffrey Smith, M.B.E., 4th edition, 3rd impression — 12s. 6d. (By post 13s.)

WALL DIAGRAMS: Rolls-Royce Derwent / De Havilland Goblin II / Metrovick F/3 Gas Turbine — 4s. each (By post 4s. 4d. each)

TURBINES FOR AIRCRAFT (4-page colour leaflet reprinted from "Flight") — 6d. (By post 7½d.)

PRODUCTION ENGINEERING Practical methods of Production Planning and Control J. S. Murphy, A.I.I.A — 12s. 6d. (By post 13s.)

THE COMPLETE AMATEUR PHOTOGRAPHER by Dick Boer. Edited by A. L. M. Sowerby, B.A., M.Sc., A.R.P.S. — 21s. 0d. (By post 21s. 8d.)

PHOTOGRAPHIC SKIES David Charles, F.R.P.S. — 5s. (By post 5s. 3d.)

From all leading booksellers or from Iliffe and Sons Ltd. Dorset House, Stamford Street, London, S.E.1

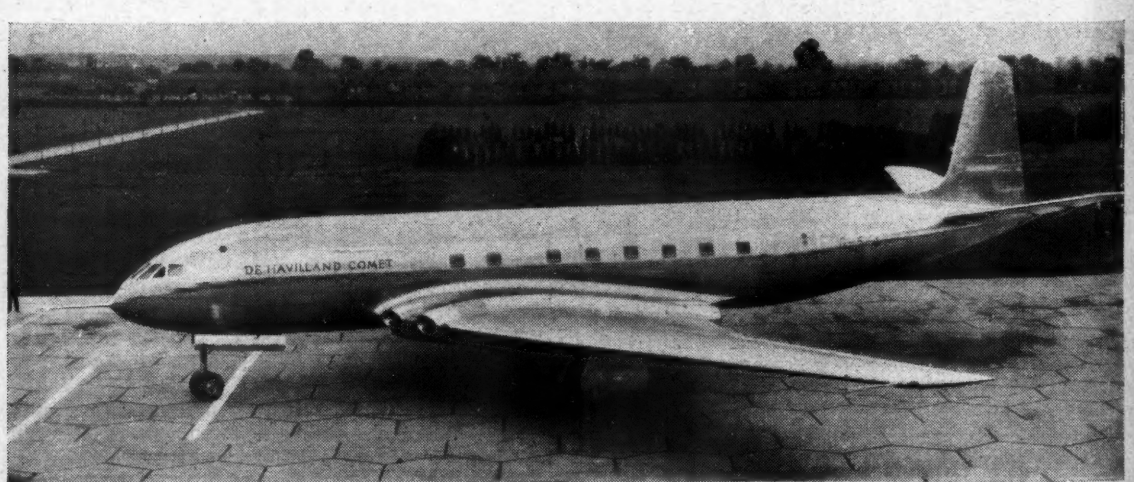
That the D.H. artist's impression of the Comet, published in our preceding issue, was a realistic rendering of the machine in flight, is proved by this impressive photographic study.

COMET IN THE SKY

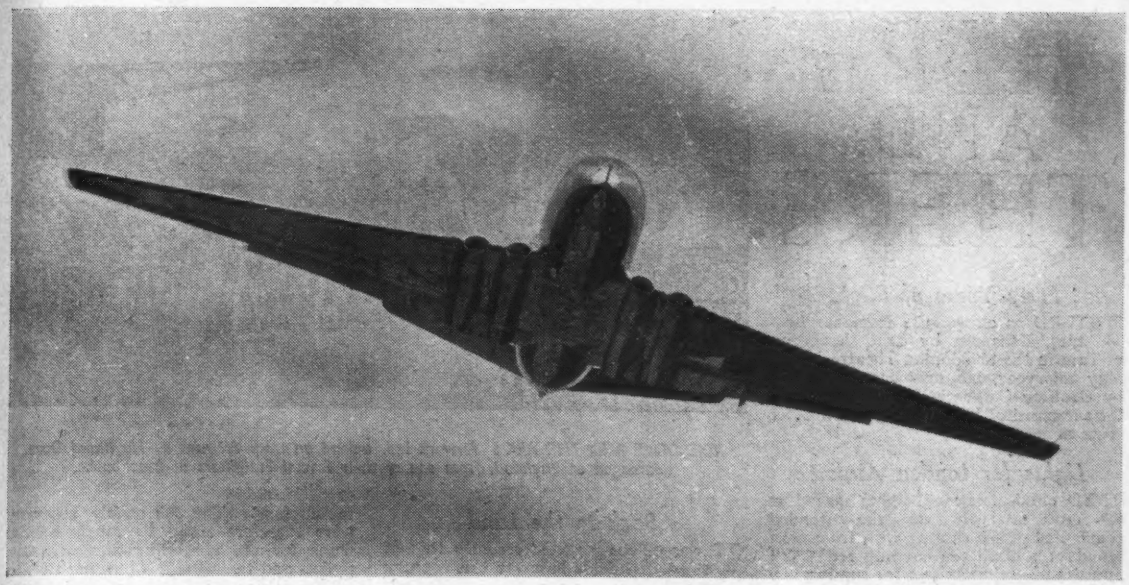
Surprise Maiden Flight of Britain's Most Advanced Air Liner

ON Wednesday, July 27th, at 6.17 p.m., the de Havilland Comet made its first flight. After take-off, John Cunningham took the aircraft up in a steady climb to 8,000ft, thence carrying out some general handling trials, including tentative explorations of the low-speed characteristics. He then brought the beautiful new aircraft down for a low-level run along the runway to sweep into a quite steep turn into the landing circuit. His landing was, as usual, exemplary, and the Comet had been airborne for 31 minutes.

Preliminary details of this latest and most advanced of British airliners were included in our last week's issue, and there is little more of a specific or technical nature to add. One of the more interesting features of the Comet's début is that it emerged from the shops for the first time at 11.30 on Monday morning, the 25th, for engine running, and in the evening did a few preliminary taxi runs up and down the runway. On Tuesday it was hoped to do the first "hop," but one or two minor snags arose and the day was devoted to engine runs, together with various items of groundwork. However, at 8 o'clock on Wednesday morning, John Cunningham took the aircraft out to continue taxying trials and wheel-brake checks. Then, at 9.50, starting with the tail almost in the hedge, Cunningham opened up all four Ghosts and, after a run of only about 200 yards, "nodded" the Comet off for a 500-yard



Perhaps better than any previous portrait, that above conveys the exceptional beauty of line which characterizes the Comet.



Strangely foreshortened, D.H.'s new jet airliner is seen on its first sustained flight. The form of the Ghost nacelles is especially well brought out by this picture.

Comet in the Sky . . . . .

hop at about 10 to 15 feet. A repeat performance was made immediately afterwards and the aircraft then returned to the apron for later inspection by the considerable gathering of visitors—ourselves included—who had been invited to Hatfield to make an external inspection of the Comet.

Unfortunately, it was not possible to show us another "flight," but as we stood around making admiring comments on the graceful and yet unmistakably workmanlike appearance of the aircraft, the engines were again started up and, with the inboard units idling, Cunningham took the aircraft out, using only the outboard Ghosts for active thrust. After making two or three circles at the runway intersection to demonstrate the tractable ground handling qualities, all four engines were opened up to take-off r.p.m. (10,250), with the aircraft held by its brakes against the 20,000 lb thrust.

The high-pitched shriek which characterizes the Goblin was noticeable also in the larger Ghost, and although the aircraft stood there as steady as a rock, the 200-yard plumes of runway dust stretching behind the aircraft added emphasis to the noise in indicating the enormous power output.

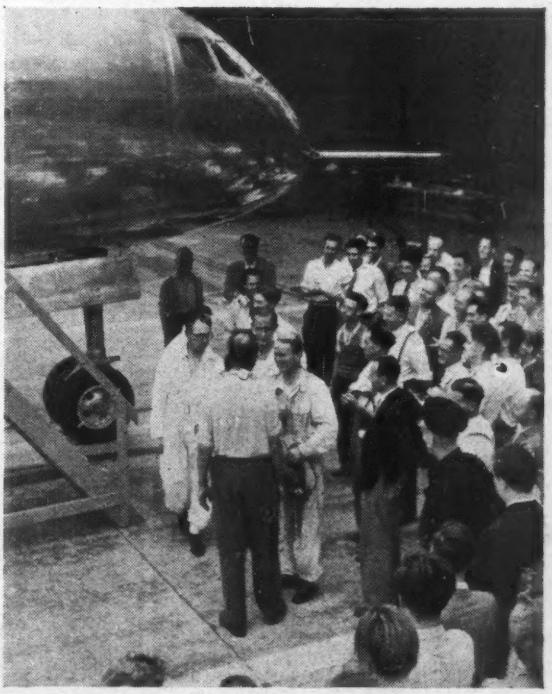
Noise Levels

We had a chat with Sir Frank Whittle about the question of noise, and he gave it as his opinion that passengers should find the Comet far and away the quietest aircraft in which they had ever flown. Sir Frank also stated that virtually no attention has as yet been paid to the problems of noise suppression in gas turbines, but that this would, undoubtedly, come about in the near future and would not, he thought, occasion any great difficulty.

There had been no previous intention of making the maiden flight on Wednesday. After the visitors had departed the aircraft was again brought out for continuance of the taxying trials, and at about 6.15 Cunningham made a flaps-down hop. Everything worked perfectly, so he decided to make the flight. Afterwards, he said that the flight was entirely successful and the aircraft was very nice to handle. In company with the chief test pilot on this important occasion were J. B. Wilson, 2nd pilot; F. Reynolds, flight engineer; A. Fairbrother, aerodynamicist; and T. Waters, flight electrician.

Serious design work on the Comet was not started until September, 1946, and that the first aircraft should come out for its flight trial preliminaries only two years and

The team spirit epitomized—John Cunningham with his crew surrounded by some of the D.H. experimental shop "hands" after the historic first flight of the comet.



ten months afterwards is a great tribute to everyone concerned.

Had the ordinary prototype practice been followed in this project, such a rapid advance as that planned would have been out of the question. By dint of collaboration all round, however, orders have been placed "off the drawing board," and it is envisaged that the Comet will be in commission on B.O.A.C. trunk routes in 1952.

HERE AND THERE

Forty Years of Flight

TITLED as above, the Romanes Lecture, delivered by Lord Brabazon of Tara in the Sheldonian Theatre during May this year, has now been published by Geoffrey Cumberledge. A real prize for aeronautical bibliophiles, this booklet costs 2s net.

Lights for London Airport

RED omni-directional lights spaced at 100ft intervals along the extended centre-line of the runway will, from next Monday, replace the existing red "V" approach lighting system for runway 280 at London Airport. This new low-intensity system of approach lighting will be used for visibilities above 1,000yd by night, and distance from runway threshold will be indicated by the placing of transverse pairs of red lights at the 1,000, 2,000 and 3,000ft marks. At the same time improved threshold lighting will also be brought into use on the same runway.

Scout Pace

AS a result of the recent shipping strike nearly 400 Scouts were conveyed by air to the Fourth World Rover Moot in Norway during last week-end. Arrangements were made by Lambert Bros., Ltd., the brokers, and S.A.S. Skymasters flew a shuttle service from Prestwick and Northolt to Oslo.

THE DOVE AND THE ARK: Airwork Ltd. unload an Iraqi Airways de Havilland Dove, damaged at Baghdad, from one of their Bristol Freighters at Blackbushe.

Back to the Land

IT was officially stated recently that of the 640 airfields in use in this country during the war 350 are still in operation. All of these have been put to some agricultural purpose, in particular grass between and around the runways, for cutting and drying. Of the 290 fields no longer in use 120 have been returned to their owners and the remaining 170 have been made available to the County Agricultural Executives' committees for unrestricted use.

Marking the Air Races Course

AS a result of suggestions by National Air Races pilots to the Dunlop Company, who supplied the pylons to mark the course, the possibility of using smoke candles on the pylons to aid visibility in mist or industrial haze was considered. Trials were made immediately with orange smoke, but the results were unsatisfactory. The Schermuly company were therefore asked to supply special flares for use in conjunction with the pylons and these, with a burning time of 3½ minutes, were found to be visible at a distance of seven miles. Fifteen flare units were allocated to each pylon, sufficient for all the high-speed races.

National Aeronautical Collection

THE National Aeronautical Collection in the Science Museum, London, was closed to the public on Monday, July 25th, preparatory to its removal to enable the unfinished wing of the Museum to be completed for use by the Festival of Britain in 1951. It is hoped to display the Collection at a later date in another building adjacent to the Museum.

R.A.F. Tattoo

STAGES in the training of R.A.F. recruits were demonstrated by 1,000 young National Service men in a full-scale Tattoo at R.A.F. Station, Bridgnorth, last Wednesday week. The Tattoo was unique in that all the boys taking part, with the exception of a small group from the R.A.F. Regiment, had less than seven weeks' training. Foot drill, arms drill and difficult "P.T." movements were executed with exemplary precision. The show had an impressive opening: Lancasters from Shawbury, led by S/L. P. Tunstall, flew over in close formation, and F/L. P. D. Scott, D.F.C., gave a display in a Vampire.

Cadets for the "Med."

SIX Lancasters, carrying staff of the Empire Air Navigation School and 19 flight cadets from the R.A.F. College, Cranwell, were to leave on July 31st on a 3,600-mile navigation training flight to Malta and Gibraltar. The object of the flight is to give E.A.N.S. staff training in flight planning and cruise control, dead-reckoning navigation, general crew

CELEBRATING: Seen during the Soviet Aviation Day held recently at Tushino airfield are (left) A. S. Yakovlev and A. S. Mikulin (respectively designers of the Yak fighters and AM aero-engines) and (right), B. I. Rossinsky, a pioneer Russian pilot and A. N. Tupolev, designer of new bombers and transport aircraft.

HERE AND THERE

training, and overseas flying conditions. The flight cadets will help to fly the Lancasters, acting as co-pilots, and understudying the flight engineers and navigators.

Far East Champions

THE R.A.F. Maintenance Base (Far East), Seletar, added to their run of sporting successes when they won the Far East Air Force Athletic Championship Challenge Cup by gaining 99 points in the R.A.F. Athletics Championships held at Seletar on June 29th, 1949.

New Vice-Chief of Naval Staff

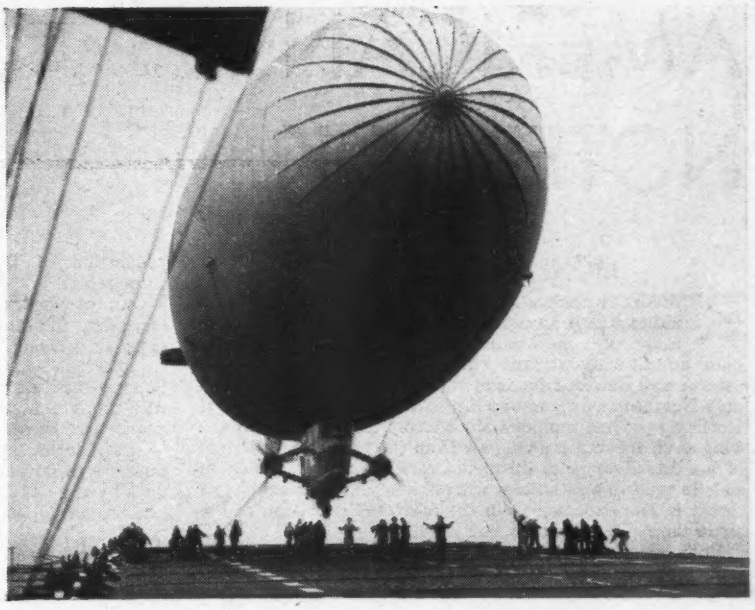
HIS friends in the flying services and the Industry will join *Flight* in offering congratulations to Vice-Admiral Sir George E. Creasy, K.C.B., C.B.E., D.S.O., M.V.O., to be a Lord Commissioner of the Admiralty and Vice-Chief of Naval Staff in succession to Admiral Sir John H. Edelsten, K.C.B., C.B.E. (to date November, 1949). Vice-Admiral Creasy succeeded Admiral Vian as Fifth Sea Lord in April, 1948.

The Tushino Display

EVENTS in celebration of Russia's Aviation Day (July 17th) at Tushino airfield, near Moscow, included a fly-past by Yak-14 high-wing light monoplanes, carrying banners; the spelling-out of "Glory to Stalin" by low-wing Yak-18s; and mass parachuting from twin-engined Il-12 transports. Participants in the display included Air Force pilots, airborne troops and members of the voluntary Society for the Promotion of Aviation. Photographs of celebrities present appear on the previous page.

Double-barrelled Shooting Star

CAPTAIN VINCENT MAZZA and Staff Sgt. V. A. James have been ejected from a Lockheed TF-80 flying at more than 550 m.p.h. From 10,000ft they parachuted into San Pablo Bay and were picked up by a launch. The ejection seats employed were of Lockheed design, in which a 37 mm cartridge supplies the ejecting charge. After ejection the seat is stabilized by automatic flaps and a small drag parachute, which releases the occupant's safety belt and opens a retarder 'chute. The occupant's parachute is opened by a static line attached to the seat.



BLIMP BASE: This U.S. Naval blimp rearmed, refuelled and replenished stores twice daily from the deck of the aircraft carrier U.S.S. "Sicily" during Caribbean manoeuvres.

Nickel Information

IN the June issue of *The Nickel Bulletin* (The Mond Nickel Co., Ltd., Sunderland House, Curzon Street, London, W.1), L. S. Fulton's "Forging Alloys for High Temperature Service" is of special interest in view of its bearing on the construction of gas turbines. The issue also contains reference to the first report in a series covering an investigation of the factors governing notch toughness in ferritic materials. This instalment deals with the effect of grain size. "Nickel Alloys v. Hydrochloric Acid," the concluding item in a symposium in Corrosion Forum, is another subject of special interest.

Dual Gliding Record

TWO members of the Cambridge University Gliding Club—Mr. J. Grantham, of St. Catharine's College, and Mr. B. E. Bell, of Christ's College—claim to have beaten the British two-seater glider altitude record by ascending to 10,000ft. The previous record (which stands until the new performance is confirmed by the Royal Aero Club) was 1,600ft lower.

News in Brief

Dowty Equipment of Canada, Ltd., Ajax, Ontario, will in future handle the business of Dowty Equipment (Canada), Ltd., which company is being discontinued.

* * *

The death is announced of Mr. E. F. Goodyear, formerly managing director of W. Goodyear and Sons, Ltd., and of the Dunlop Rim and Wheel Co., Ltd., Coventry.

* * *

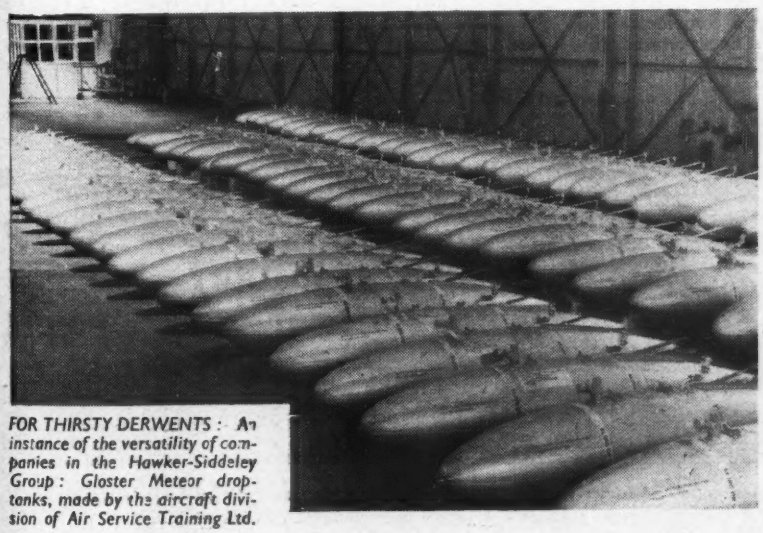
The first production Chipmunk is now flying at de Havilland's Hatfield works. This appealing tandem-seat monoplane will be supplied in quantity for "V.R." service.

* * *

The R.A.F. Benevolent Fund announce that the telephone number of their London headquarters, 67, Portland Place, W., has been changed to LANgham 8343/9.

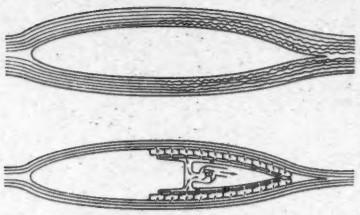
* * *

For the use of instructors showing the Shell series of films *How an Aeroplane Flies*, a particularly well-thought-out series of notes has been prepared, in printed brochure form. Copies are loaned with the films, which are distributed by Petroleum Films Bureau, 29, New Bond Street, London, W.1.



FOR THIRSTY DERWENTS: An instance of the versatility of companies in the Hawker-Siddeley Group: Gloster Meteor drop-tanks, made by the aircraft division of Air Service Training Ltd.

AMERICAN NOTEBOOK



By "Favonius"

MONEY-BOX SLOTTERY

RESEARCH studies now being conducted by Northrop indicate that an equatorial round-the-world non-stop range of 25,000 miles may eventually be possible with an all-wing aircraft equipped with boundary-layer control and powered by twin turbo-prop engines—presumably Northrop's own 10,000 h.p. Turbodynes. The present Northrop scheme employs air blowers installed within the wing envelope and drawing air from the boundary-layer aft of the transition point through a series of spanwise suction slots in the top and bottom wing skins. An appreciable jet thrust is also expected from the rearward expulsion of the air in the region of the trailing edge.

Both theory and wind-tunnel tests have demonstrated that boundary-layer control by suction should be an effective means of obtaining high wing lifts. If flow separation on the upper surface could be sufficiently delayed, maximum lift coefficients of the order of 5.0 to 6.0 appear feasible. In full-scale practice, however, the aerodynamic efficiency of such a scheme is dependent on many variables such as the number, location, width and shape of the slots; aerofoil section; types of flaps (and ailerons, if employed); and, of course, the power expenditure involved.

It is not surprising, therefore, that earlier full-scale experiments have not yet approached the theoretical possibilities. Wright Field, for example, did some very interesting experiments with a suction-slotted wing fitted on a Stinson-Vultee L-1 Vigilant in 1944. The blower was mounted in a hump over the wing centre-section and was driven by an 80 h.p. Franklin air-cooled auxiliary engine located in the fuselage, while spanwise ducts between the spars connected the three full-span suction slots to the blower. These slots were located at 60, 80 and 98 per cent of the wing chord.

Despite the added incentive of full-span, 40-per-cent-chord double-section trailing-edge flaps, with the front section adjustable to 35 degrees and the rear section drooped down 82 degrees, this wing was unable to develop a maximum lift coefficient greater than 3.6. Such a value, of course, is not much higher than can be expected with full-span front slats and double-slotted or Fowler-type rear flaps —albeit obtained without the mechanical complexity and power expenditure of suction blowers. The structural difficulties of obtaining adequate torsional stiffness with a large proportion of the wing skin mutilated must also be formidable.

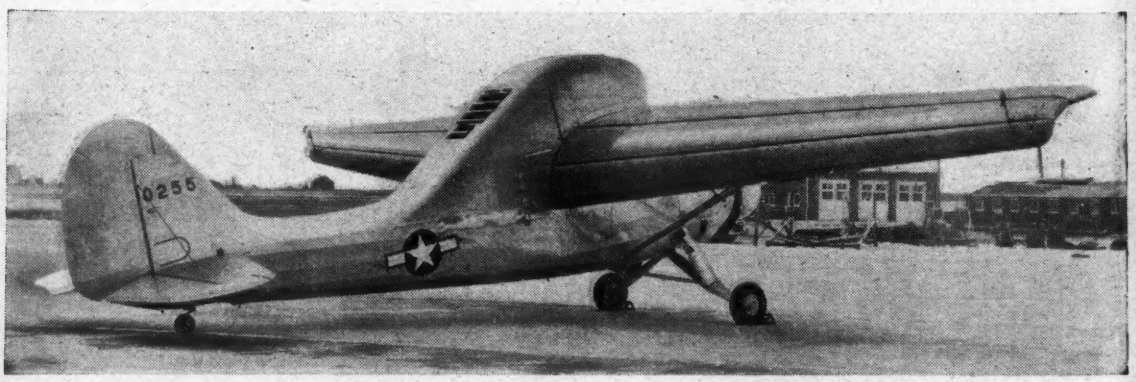
Current Northrop research is being directed more towards increasing the range of all-wing aircraft by reduction of the drag at cruising lift coefficients. Heading this scientific exploration is Dr. Werner Pfenninger, formerly of the Federal Institute of Technology at Zurich, Switzerland, who was brought to the U.S.A. by Northrop in January this year. Dr. Pfenninger's Swiss research on boundary-layer control, started in 1941, has shown promise of drag reductions up to 50 per cent—which would mean in the case of an all-wing bomber such as the B-35 or B-49, an overall minimum drag coefficient of the order of 0.005.

Although this figure is admittedly based on low-scale model data, there is general agreement that an ecaudate wing configuration does lend itself admirably to this type of aerodynamic research, since the obtrusion of the conventional fuselage and tail takes a lot of the gilt off the gingerbread. Full-scale evidence of this can be seen in the Armstrong-Whitworth AW-52 twin-jetted all-wing with boundary-layer control. Based on a suction of about 3,000 cu ft per second, the Northrop researchers expect to cut down the power required, due to reduction of the drag through boundary-layer control, to about one-quarter of that normally required on the present Flying Wing. This big reduction also includes the requisite pumping power expenditure!

On these cheerful assumptions, then, our Northrop friends estimate that a turbo-propped B-35 could circumnavigate the earth at the equator—without refuelling. Just where such an equatorial equipage fits into the military rangefinder now that high-speed aerial refuelling has successfully reached the global stage is, perhaps, a controversial point. Looking over the civil transport side of the balance sheet, we fancy that any economy-minded operator would prefer to exploit the boundary-layer by sucking in more pay-load instead of fuel for unnecessary range. In this way, the all-wing slottery might become a very useful money-box.

A FIGHTING WEATHERCOCK

FOLLOWING hard on the tail-pipe of Lockheed's XF-90 penetration fighter, test flown at Muroc only a few weeks ago, comes announcement of another Lockheed nonagenarian, the F-94 two-seater all-weather jet fighter. The



An early full-scale experiment in boundary-layer control. A Stinson-Vultee L-1 Vigilant modified by the Dow Chemical Co. for Wright Field in 1943-44. The suction blower for the wing slots is installed in the hump over the centre-section.

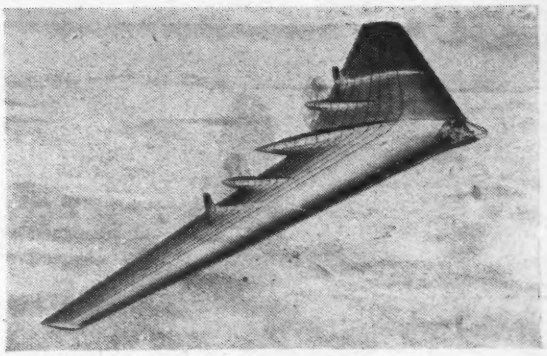
F-94, as briefly noted on page 8 of our July 7th issue, is a radar-equipped variant of the TF-80C two-seater jet trainer. Its mission will be high-altitude interception of enemy attack, especially under conditions of bad weather and visibility that would ground the ordinary jet fighter. The installation of modern radar equipment and a radar operator enable this new type of U.S.A.F. fighter to operate all round the clock, day or night in foul weather or fine.

Basically, the F-94 is really a structural derivative of the F-80 Shooting Star, in so far as the wing, tail, mid-section fuselage and landing gear are concerned; hence its production will require a minimum amount of new tooling. Since the same major assemblies are used for the F-80, TF-80 and the F-94, Lockheed plan to build them on parallel assembly lines, which obviously leads to considerable economy of time and money. Also, because of the structural and internal affinity, the first F-94 was completed much sooner than the usual minimum design and development period of 18 months for a new jet fighter type. At the moment, Lockheed have 110 F-94s on order.

The most noticeable differences between the F-94 and the now familiar F-80 are the bulbous nose and tail extremities of the F-94 fuselage. The nose houses a Hughes airborne radar with 18-inch antenna and an armament installation of four 20-mm cannon, while the tail-pipe is fitted with a Solar after-burner which considerably boosts the normal 4,600 lb static thrust rating of the Allison J-33 turbo-jet. Lockheed after-burner research has shown promise of very substantial thrust augmentation gains amounting to as much as 50 per cent at low speed and 100 per cent at sea-level top speed—which means that the overall thrust of the turbo-ram-jet combination could vary from nearly 7,000 lb at take-off to over 9,000 lb at sea-level top speed.

Once the after-burner technique is perfected, it will solve some of the outstanding snags inherent in jet fighter design—particularly the sticky take-off occasioned by the low thrust at low speed. The aforesaid Lockheed design studies have indicated that, whereas the gain in top speed is of the order of 10 per cent, the take-off run to clear 50ft can be halved and the initial rate of climb increased by as much as 200 per cent. At present, these figures are undoubtedly a bit optimistic, since current after-burners are probably delivering about 60-70 per cent of the gains postulated on paper.

Because in engineering design we never get something for nothing, these performance gains are obtained at the expense of further mechanical gadgetry—even though the actual weight increase is not alarming—about 20 per cent of the weight of the turbo-jet. There is a relatively small loss in the exhaust gas stream from the turbo-jet when the after-burner is inoperative, due to the obstructive



A mythical Northrop Flying Wing with boundary-layer control and powered by two 10,000 h.p. Northrop turbodyne engines. The design looks like a cross-breed between the B-35 and B-49 bombers. Note the new type pilots' cockpit with greatly improved view.

effect of the burner installation. With careful design, this thrust decrease can be kept down to less than 5 per cent. One more item of gadgetry is the necessity of a variable-area exit nozzle to the tail-pipe, in order to maintain the same pressures and temperatures in the turbo-jet engine, with or without the burner in operation.

The fuel consumption of the after-burner ram-jet is naturally very high, but this is not a serious obstacle, because its use is intended only for short periods when high performance is demanded. Moreover, studies indicate that in a climb to, say, 40,000ft, the total amount of fuel consumed by a turbo-jet plus after-burner may be the same or even slightly less than that used by a turbo-jet making the same climb without benefit of such an extra—due, of course, to the time differential in the respective climbing rates.

Whilst most of the recent progress in after-burner design and flight development appears to be taking place in the U.S.A., it might be recalled that this form of jet power boost was initiated in England as long ago as 1944. Its development was spurred forward under the impetus of London's "V-1" bombardment, as it was thought that later fly-bomb versions would be faster and more difficult to shoot down from pursuing aircraft. Known at that time as "re-heating," a two-seater Meteor with Rolls-Royce Wellands, was modified at the R.A.E. with an after-burner installation, and considerable research data was obtained from flight tests. It is even possible that

The Lockheed F-94 all-weather jet fighter developed from the F-80 fighter and TF-80C trainer. The pilot is seated in front with radar operator behind. Note the bulbous radar nose and enlarged tail pipe mounting a Solar after-burner. An Allison J-33 radial-compressor turbojet, normally rated at 4,600 lb s.t., is fitted.

One of Northwest Airlines' Boeing Stratocruisers.

American Notebook . . . . .

the results of this research will appear some day in a very expensive official brochure with a blue cover.

GALLEY SLAVES

SOONER or later at some period of his professional life, every engineer is made keenly aware that his destiny is ruled by the politician—the Sons of Martha "must wait upon Mary's sons, world without end, reprieve, or rest" —in Kipling's vibrant verse. The story of B.O.A.C.'s Stratocruiser deal is a perfect illustration of the truth of this dictum. When the full story finally leaks out—and truth, in the fulness of time, always bubbles to the top of the pot—it will make a sorry stain on the political carpet. It goes almost without saying, however, that the Sons of Mary will then rise to their suavest.

The full story is too long and involved—and almost beyond credence—to be given here at this time. It needs, indeed, a thorough scrubbing and airing in the public Press and in the High Court of Parliament, so that the patient British people can see how their hard-earned hard dollars have been draining away through the North American sink. But a typical example, of concern to the engineer as well as the patriot, will serve to signpost the way to the wash-house—which in this case happens to be the cook-house, or chef's galley.

Most people know that the basic Stratocruiser specification was drawn up by Pan-American, who have 20 on order and prior claim on deliveries. The Pan-Am interior arrangement calls for the galley directly aft of the main cabin, and this layout might rightly be considered the standard Boeing design, since practically all the other air lines adopted it. B.O.A.C., however, decided to "improve" on the standard scheme by installing the galley amidships opposite the stair-well to the lower lounge. In this strategic position, it was argued that the stewards would not have to trundle a trolley up and down the full length of the cabin—the bright idea being to serve Ye Olde Roast Beef and Yorkshire right into the passenger's lap à-la-Simpson's de-la-Strand, so to speak.

This trifling mod was optimistically estimated to cost around $30,000 extra per aircraft. (An interesting point is that the secondary changes arising from the re-design of the seating accommodation cost more than the re-location of the galley, so we are told.) It was also planned to design and build the galley at B.O A C.'s maintenance shops in Montreal and have Boeing's install it at Seattle. As any engineer could have foreseen, this kind of long-range liaison caused a vast amount of grief and scurrying to and fro from one side of the continent to the other—blithely burning up the dollars in transit. Our guess is that all this totally unnecessary change has cost the British taxpayer a full extra half-million precious dollars.

When this astonishing deal was originally contracted, the basic Stratocruiser price was in the region of $1¼ million, or about $8 million for the half-dozen aircraft on order. To cover fully the six aircraft and spares, the Treasury was finally cajoled into setting an absolute ceiling of $12 million, the contract permitting Boeing to cover any rising costs of labour and materials by an escalator clause. (The kind that go up, but seldom come down!) Boeing's also require (very naturally from their standpoint) a considerable down payment with order, which means that a substantial part of the taxpayers' $12 million has already passed over the counter, and B.O.A.C. still have nothing to show for it.

All the current signs clearly indicate that the original budget of $12 million will be considerably exceeded by the time the Stratocruiser comes into B.O.A.C. service and starts operating in the troposphere. Incidentally, the time taken to deliver this expensive piece of American merchandise needs another turn of the public wringer. Our original guestimate before it could earn a hard dime was the spring or summer of 1950, and this guess begins to look fairly close to the mark. On top of all this callous extravagance by officials in the beefsteak area, the Stratocruiser is now making the headlines with propeller and supercharger troubles. Both Pratt and Whitney and General Electric are reported to have derated the cruising power and altitude ratings of the civil Wasp Major.

Trouble is also brewing over the operation of the Stratocruiser with the U.S. Air Lines Pilots' Association, who charge that the C.A.A. changed its safety regulations to permit certification at the present gross weight with automatic feathering propellers. One evidence of this—for all the world to see—are the extraordinary measures now being taken at Los Angeles Airport to accommodate this aircraft. An additional 2,000ft strip has been cleared off the end of the present 6,000ft runway, although it means closing the main highway (which skirts the west side of the airport) at the time a Stratocruiser is taking off or landing.

This unusual situation is being handled by a hinged wooden fence, which is lowered in conjunction with a highway traffic signal. Driving by the other day, we were joyously reminded of the days of our youth as we watched the trains rattle over a level-crossing. It is a striking example of the way the wing loading is piling up in civil transport design and how the airports are being re-designed to fit. Eight thousand feet is a lot of runway, so it will be intriguing to observe how B.O.A.C. handle this situation when they start to operate their Stratocruisers from North Atlantic terminals. But still more interesting should be the reaction of the Treasury when the stratospheric bill is finally added up.

RECRUITING, TRAINING AND LICENSING

Report of the Committee Formed to Inquire Into the Provision of Qualified Staff for Civil Aviation

A COMMITTEE under the chairmanship of G/C. C. A. B. Wilcock, M.P., has now issued its report on the recruitment, training and licensing of personnel for civil aviation. Included in the terms of reference was the review of present licensing arrangements and the recommendation of amendments, if necessary. The Committee was also briefed to consider and make recommendations with regard to steps which could be taken to ensure an adequate flow of aircrew and ground personnel into the industry. Comparison was to be made between the standards required of all categories of personnel for Service and civil aviation purposes with a view to making them available for civil aviation from Service sources after as little additional training as possible. Other sources of recruitment were also to be considered.

The Report stated what requirements were likely to arise during the next ten years and estimated the increased numbers of personnel which would be required each year up to 1950 (the post-war period during which increases would be abnormal) and from 1950 to 1957. Taking into account the probable introduction of larger and faster types of aircraft, the number of aircraft hours flown in 1957 by the Corporations and charter operators was estimated at approximately 140 per cent and 200 per cent respectively, of those flown in 1950. It was thought that the numbers of skilled personnel would be roughly proportionate to the total aircraft hours flown. The Committee considered that the increase of 40 per cent in pilot requirements would be offset by an expected greater pilot utilization than was obtaining at present in the Corporations. In the case of the charter companies, however, although a factor of two was applied to the 1950 figure to obtain the 1957 figure, a reduction of 25 per cent was made for possible rationalization within the industry and greater pilot utilization. The annual wastage of pilots because of retirement or for other reasons was assumed to be ten per cent.

Fewer Navigators

It was assumed that the demand for staff employed solely as navigators would eventually decrease in proportion to the improvement and increasing production of radio and radar aids to navigation and to the increasing trend towards combining the functions of first or second pilot and navigator. It was also assumed that the number of radio officers required would be proportionate to the number of pilots up to about 1950, after which the requirements would decrease and become stable because of the improved simplicity and reliability of navigational aids and increased facilities for international communications by R/T in the English language. Users' estimates predicted a slow increase in the number of flight engineers required up to about 1951 and stability thereafter. Wastage rate for the three latter categories was estimated to increase to eight per cent after an initial low figure.

In the ground staff categories, figures for aircraft maintenance engineers were based partly on users' estimates and partly on a calculated relationship between the numbers of engineers and of pilots; the wastage rate was estimated to be six per cent annually. A similar wastage rate was estimated for aircraft radio maintenance engineers but for air traffic control officers the estimate was very low initially, increasing to five per cent ultimately. Similarly for ground radio operators it was assumed that the wastage rate would be very low at first, increasing to seven per cent by 1957.

On the prospects of careers in civil aviation, the Committee considered that the attractive feature for pilots, apart from the intrinsic attraction of piloting, was the prospect of a good salary at a comparatively early age. Chief deterrents to recruitment were the high cost of training, the relatively early retiring age and the general insecurity of employment outside the airline Corporations. Since the age of retirement was about 45, the flying life of a pilot was only 20 to 25 years. A pilot nearing the retiring age was found to represent an accumulation of expensive training and valuable experience and the Committee considered that the present circumstances in which this accumulation had to be written off should not be accepted without question.

The Committee examined also the career prospects of other personnel employed in civil aviation and reached the conclusion that although the industry was passing through a difficult phase at present, there was sufficient evidence to suggest that there would be steady development and expansion from about 1950 onwards. It was recommended that the M.C.A. should prepare a booklet on careers in consultation with the National Joint Council for Civil Air Transport and other organizations concerned. Special attention was paid to the provision of pilots since the most serious shortage was thought likely to occur in that category. It was considered no longer practicable for a candidate wishing to become a professional pilot to obtain the necessary minimum qualifications comparatively cheaply. The cost of training to the minimum standard practicable for employment would be £1,200 to £1,500 and if training was necessary to the standard at present required by the Corporations and many charter companies, the cost would increase to many thousands of pounds. From the point of view of national economy the fullest use should be made of ex-R.A.F. personnel. To provide a satisfactory procedure for the engagement of Service personnel the Committee recommended that a pre-selection scheme and standing liaison committee should be established. It was further recommended that the M.C.A. should estimate the civil requirements from time to time in order to assist the Air Ministry in arranging facilities for R.A.F. personnel to obtain the necessary civil licences whilst still in the Service. The committee were of the opinion that the industry would need all the suitable ex-R.A.F. pilots it could obtain. Although it was recommended that initially the liaison standing committee should deal only with aircrew, it should from time to time consider the advisability of extending the pre-selection scheme to other personnel in the R.A.F. who might be suitable for employment in civil aviation.

State Aid Recommended

In view of the State's responsibility for civil aviation and the fact that a scarcity of pilots would cripple British air services, the Committee could see no practicable alternative to the provision by the State of financial aid for pilot training purposes, particularly as the supply of ex-R.A.F. personnel would not suffice for civil needs. It was therefore recommended that initially the State should provide scholarships for training 40 per cent of the new pilot entrants required from civil life. Thus, if the total number of non-R.A.F. entrants required annually averaged 225 and the cost of a year's training course was between £1,200 and £1,500, the maximum annual cost to the State would be between £110,000 and £135,000. In making the recommendation the Committee drew attention to the fact that unless such aid was given British civil aviation would be seriously restricted in a few years' time and that the expenditure would not all be additional since, without State aid the three Corporations would find it necessary to provide initial training themselves. The scheme should be evolved by the M.C.A. in consultation with the Ministry of Education and the air transport organizations concerned and the training required would be partly academic and partly flying.

It was thought necessary to divide trainees into two categories—those who wished to make their entire career as pilots and those who wished to obtain pilot qualification as part of their training for a career in civil aviation. For this purpose it was thought that existing training establishments in the United Kingdom should be adequate and it was recommended that those regarded as suitable by the M.C.A. should be initially recognized as "approved" for the purpose. To avoid the situation whereby personnel trained at their own or State expense were subsequently unable to find employment in aviation, it was thought that candidates should be selected by employers while under training, on the same lines as the scheme suggested for the R.A.F. To gain further flying experience for more senior licences trainees should be given as much experience as possible as second pilots in large aircraft.

The Minister of Civil Aviation did not agree with some of the findings and recommendations and considered the figures for pilot requirement to be overstated. He thought there would be no lack of pilots before the end of 1951 but agreed that it was necessary to estimate the number of personnel required and available from Service sources, at regular and frequent intervals. He could not accept, without further examination, that aid for the training of entrants from civil life should be provided from public funds, nor did he accept in principle that public funds should be made available to assist pilots to obtain qualifications required by the regulations.

Main base of the Manitoba Government Air Service. A strip has been cleared beside the lake for landplanes.

BUSH FLYING IN MANITOBA

The Duties of a Representative Air Service

By Robert Russell

ALTHOUGH the Manitoba Government Air Service has only been established for the last few years, it has certainly become one of the most important bush-flying organizations throughout the length and breadth of Canada. Carrying on a tradition which was originated after the first world war, the Province of Manitoba, together with those of Ontario and Saskatchewan, has moved ahead of the rest of the country in operating its own vital air-lines. Alberta and British Columbia, provinces which have also gone ahead with their flying services, have not yet taken the work entirely into their own hands but still engage private operators to assume a share of it.

From the very beginning bush flying has filled a most important economic need in Canada and operators have been able to pay their way without Government support. The swiftly expanding traffic on bush lines was mainly responsible for opening up the northern sections of the country and greatly helped the development of such major industries as mining and trapping. It is important to realize that there has been a direct line of development and that bush flying owes its position to-day to the footing gained as early as 1920.

All freighting operations carried out over Canada are closely related to bush flying. The greater part of the total area of Canada is uncultivated, some parts are barren, and much is forest or snow-covered. It is fair to say in general that the large commercial operators and the privately owned transport companies do much the same work, but on a different scale.

To give some idea of the advances which have been made in transport operations a few significant figures may be quoted. Air freight, which had its inception along Canada's northern air routes, had continued to increase in volume until at the beginning of the late war this Dominion's aircraft were carrying the world's greatest tonnage of commercial air cargo. In 1920 only 6,740 lb of freight were taken by air, but in the year 1937 this figure increased to 24,000,000 lb. In 1939 the total figure dropped a little to 19,500,000 lb, but this load was still double that carried in the whole of the United States during the same period. By 1946 the total rose again to the immense figure of 23,500,000 lb.

This clearly shows the great volume of air transport operations carried out in the Dominion and makes it much easier to understand the importance of the part played by the various independent air transport organizations in the economy of the country. The work of the bush flier is an integral part of the entire set up, and the companies provide the very life blood of small and isolated communities scattered over the most remote areas of the provinces.

Among the many different jobs undertaken by the pilots of the Manitoba Government Air Service are included such items as forest patrols, flying-in of supplies, mercy flights, transport of Government game- and resources-personnel to out-of-the-way places, restocking lakes with fish and the taking of a regular game census in certain areas.

The history of the development of this Service is similar to that of many other bush operators over the same period, so it is perhaps permissible to consider it as representative and give a brief outline of work from the year 1932. In that year the R.C.A.F. had been forced to cut down on expenses and numbers of aircraft. The Manitoba Government, which up to that time had always chartered its aircraft from commercial organizations, came to an agreement with the Government and purchased five surplus Vickers Vedette flying boats, two spare engines and a good supply of parts. These became the equipment nucleus of the Manitoba Government Air Service.

Early operations took the form of flying patrols for the Department of Forestry and flying fire-fighters to their work. They were so successful and reduced the time of transport so much that other departments called for similar services and so an expansion was required. In 1933 a complete reorganization took place to improve the efficiency of the service, and it became obvious that new and faster aircraft were required. However, it was not until 1938

A newly delivered Beaver and, in the background, a Norseman, awaiting their crews for the flight to their operating base.

BUSH FLYING IN MANITOBA . . . . .

that the Vedettes had all been disposed of and replaced by four new cabin aircraft.

During the early days of the service the Manitoba Government made it a policy to be completely self-contained. It took on the best available maintenance staff and built up a workshops and stores organization so that it was able to handle almost any type of repair work that happened to come along. It is significant that there has not been a single fatal accident in the history of the concern.

In the course of its duties difficult times have been experienced. The great forest fires which broke out during the dry summer of 1940 caused much overwork and strain on the part of the organization. Naturally, too, the second world war placed a further strain and drain on personnel. During the same year a system whereby aircraft were to be based at the various survey camps was inaugurated to help relieve the pressure of work. It proved extremely satisfactory and, used in conjunction with a radio network set up at about the same time, helped considerably in giving early warning and protection against forest fires.

Thus the Manitoba Government aircraft took a leading place in Canadian aviation. An extension of duties followed expansion and several new forms of employment were found. Some of the work is worthy of description in more detail.

In connection with fire fighting, for instance, the Air Service Patrol now keeps a full-time lookout for outbreaks and, when spotted, radios back to base where men are immediately directed to the exact location. In some cases where direct overland approach is impossible, the Service will fly in men, supplies and equipment, and in the event of fire-fighting parties being temporarily cut off the aircraft are able to direct operations from the air.

Very valuable work is done in a quite different field, namely, transplanting beavers to areas where they are scarce. These animals are taken by air, in such machines as the Fairchild Husky, the Norseman, the D.H. Moth, or latterly the D.H. Beaver, all of which types are in active service with the Manitoba Government Air Service. The animals are contained in wire cages and are released over the side of the aircraft after it has landed on a stretch of water close to the area to be stocked. A somewhat similar type of work is the "planting" of young fish. These have to be carried in specially designed tanks with oxygen supplied to the water. In this case they

The Director of Manitoba Government Air Services, Mr. J. Uhlman, seen with his pilot and mechanic, transmits instructions by radio.

A ski-equipped Fairchild Husky unloads supplies at a frozen-lake base.

BUSH FLYING IN MANITOBA . . . . .

are dropped from the aircraft while flying at low level over the lakes or rivers to be stocked.

Two important emergency functions are the flying of medical or other supplies to stricken areas and the conveying of isolated casualties to the nearest hospitals. Air ambulance work of this nature has been carried out by the M.G.A.S. for the last fifteen years, and during 1947 27 emergency and 24 other cases were lifted.

Despite the fact that the aircraft have to operate from such rugged and uninhabited areas the M.G.A.S. has permitted no let-up in the matter of aircraft and engine inspections, and an efficient maintenance service has been built up to ensure that all the machines are kept in first-class condition at all times. Each aircraft is required to undergo a careful check before every flight.

A schedule of seasonal conversion and servicing operations has been devised for the aircraft. Many of the machines can be fitted with either skis or floats, and consequently in winter the floats are removed and repaired while the skis are being used. When the summer comes along again time is available for attention to the skis.

The radio department of the M.G.A.S. has to operate in some very out-of-the-way places, and the headquarters of the section have been considerably enlarged during the last few months. Thirty-nine transmitter-receiver units are being used (ranging from 2 to 400 watts) and more than 20 stations are now in existence in the northern area of the Province. Four of the aircraft are equipped with two-way radio, while during the summer months two patrol boats situated on Lakes Winnipeg and Winnipegosis carry radio equipment. Some of the forestry towers have receivers and transmitters, and several field parties can be equipped with portable sets for communication with their bases.

Thus the Manitoba Government Air Service carries on its work of patrolling and opening-up the remote areas of the Province and doing its share of bush transport in the great co-operative bush-flying network which plays so important a part in the work and very existence of so many Canadians.

In spite of the tremendous increase in bush flying operations over the entire Dominion from east to west coast, there is still an urgent need for a greater organization. In 1948 one million acres of Canada's forests were destroyed by fire, and this figure is lower than the annual average. From the point of view of the country's wealth it represents a loss of about £12,000,000 sterling. The leading Canadian publication on timber has stated that Canada is far behind both the U.S. and the U.S.S.R. in dealing with the problem of forest-fire control.

As may be seen from the accompanying illustrations only quite small aircraft are at present in use, and even the great Province of Manitoba can muster only a mere handful of machines. Until the Canadian aircraft industry produces larger aircraft suitable for the work of the bush operators further expansion is likely to be slow. There is at present no Canadian-built aircraft for transport operations between the sizes of the D.H. Beaver and the Canadair Four, and there would seem, therefore, to be a market for British aircraft, several of which, either in their present form or with some adaptation, would appear to be suitable for the work which still requires to be tackled.

THE NATIONAL AIR RACES

Elmdon Last Week-end: King's Cup and Seven New Events

ALTHOUGH many of the competing aircraft arrived at Elmdon on Thursday, it was not until Friday morning that the full concourse of types for the King's Cup, and other events comprising the new meeting known as the National Air Races, could be seen in all their varicoloured diversity. The clean, modern buildings, the myriad national flags, the array of tents, marquees and stands for the expected multitudes of spectators, all contributed their meed toward creating a most pleasant sense of anticipation for a holiday week-end unique not only for aviation people, but also for those who would be watching. That the public attendance for which provision had been made failed, in the event, to come up to expectations was naturally disappointing to the organisers; but the drastic cutting of admission prices on Monday brought a notable improvement.

As we walked around the parked aircraft, pilots and their friends were to be seen polishing away and carrying out all the last-minute odd jobs that are a permanent feature of racing in all fields of endeavour. Cole's Comper Swift, *Black Magic*—not only the sole example of its kind left in existence but also the oldest aircraft in the race (it is only three years younger than its pilot, Anthony Cole, who is the youngest entrant)—looked very pretty in its coat of high-gloss black paint, and had its control surfaces hinge-shrouded, and wing-folding gear and locker faired over.

Paine was having trouble with uneven wheel brakes on his Miles Hawk Speed Six, and the Mosscraft M.A.2 (Cirrus Minor I) had its C. of A. mislaid; conditions were too bad at Barton for the Mosscraft I (Pobjoy Niagara) to go up and collect the document so arrangements were made to send it down by road. The Moss brothers (W. H. and R. A. S.) could breathe again.

Then Messrs. Rowarth and Dancy—accompanied by a brood of trainee handicappers—made their official scrutiny of the aircraft to verify that everything was as declared. Breen-Turner had a Fairey metal airscrew on his Messenger IIA instead of the wooden airscrew declared as, in the meantime, the wooden-blade tips had "gone"; but as the new prop was standard for the aircraft all was well.

King's Cup and Kemsley Challenge Trophy pilots—who were to practise on Friday—gathered at 12.30 for a briefing by D. S. Scoffham, secretary of the meeting, and they were instructed in the best Bradshaw tradition. With the westerly wind prevailing which was gusting to about 25 knots—the drill was to take off on Runway 250 and, 600 yd beyond the end, turn sharp to port round the "scattering point" (a mast with a tent below it) for Knowle Turn, five miles away to the S.S-E. On this, the first leg, the only hazard was a pair of grid lines 33 ft high and 300 yd apart. At Knowle the course swung N.E for a run of 6.4 miles to Corley Turn. Here again there were 30 ft grid lines crossing the track and, about a mile to starboard, another line of grid pylons 100 ft high zig-zagging roughly parallel to the course for the last three-fifths of this leg.

From Corley a change in direction to N.W had to be made for Coleshill Turn 4.3 miles away, there being no hazards on this leg.

Some of the high speed entries on the tarmac at Elmdon. The Spitfire and Sea Fury trainers are seen in the foreground

However, on the last leg of 4.3 miles W.S-W from Coleshill to the Airport were three lines of 100-ft grid cables to menace competitors, the more seriously in that they were disguised by tree-covered rising ground.

Apologies were made by Col. "Mossy" Preston for the poorness of the course; but it was the best which could be planned in the area. We were able to fly round in the D.H. Beaver, and can affirm how difficult it was to "get a line" and, worse still, to pick up the turning-point pylons. These were only 35 ft high, and the well-wooded, gentle-rolling nature of the terrain made it hard to see them sufficiently early to be of much use to any but those pilots of the slowest types. Our purpose in making the Beaver sortie was, in fact, to obtain clear "competitor's approach" photographs for display in the briefing tent as a help to all concerned. As an aid to the High-speed Race pilots, sodium flares were to be laid on at the turns, and this news was welcome.

A safety height of 250 ft was recommended, in view of the grid

The winner of the King's Cup Race, Somers' Gipsy Major Gemini dives for the finishing line. (Inset) J. N. Somers, winning pilot, proudly displays the King's Cup which he will keep for ten months

A. L. Cole, youngest competitor, in his veteran Comper Swift

T. W. Brooke-Smith flew luxuriously in the Short Sealand amphibian

(Above) Neville Duke, confident before the Kemsley Race. (Below) Messrs. Dancy and Rowarth, with lieutenants, check Milli's Hawk Trainer

The National Air Races . . .

hazards, and the onus of safety was on overtaking pilots. In the event of trouble on the first leg, Honiley was an emergency field, whilst comparable alternates were Baginton for the second leg and Castle Bromwich for the third and fourth legs.

Competitors then got airborne in heat order for the official practice laps, and it was only too apparent from the various headings made that most pilots were finding the Airport-Knowle turn, or first leg, particularly difficult to define. This was less marked among Kemsley Trophy competitors. Conditions were very bumpy, and most of the high-speed men had uncomfortable rides. Cunningham collected a bump in one of his turns which, in conjunction with his speed, momentarily gave an estimated 7*g* and started a few rivets in the Vampire's port nav-light fairing.

THE KING'S CUP RACE. A field of great variety, numbering 36 aircraft, competed in this handicap event for the King's Cup and for prize money offered by the R. Ae. C. Three heats (£25 for each winner) were flown on the Saturday afternoon and the final followed in the evening. After the first lap of Heat 1 it was apparent that J. N. Somers in his beautifully prepared Gipsy Major Gemini III had literally pulled a fast one on the handicappers, for, lapping at 165 m.p.h., he improved on his handicap speed by no less than 9 m.p.h. Cole on the Comper Swift (128 m.p.h.), Fillingham, Chipmunk (139.5 m.p.h.) and the scratch man, Paine, Hawk Speed Six (185 m.p.h.) qualified for the final. The Proctors and Tommy Rose's Gemini went well but could not gain a place.

IN this account of the Friday-to-Monday meeting, written on the spot by members of the staff of "Flight" and illustrated by "Flight" photographs, the progress of the eight races is recorded; next week, detailed results and further impressions will be given.

Heat 2 again saw a scratch man—Brooke-Smith in the Sealand amphibian—move into the final, his speed being 168.5 m.p.h. First home was J. C. Milli in a blue single-seat Hawk Major (123.25 m.p.h.); second, Alington in the little Sparrowhawk (163 m.p.h.); and third, A. Cdre. Oliver, flying at zero feet and almost scraping the pylons in his dark blue Gemini (141.25 m.p.h.).

Five aircraft from Heat 3 qualified for the final after a close race, but unfortunately neither G/C. Peter Townsend (sixth), flying a Whitney Straight for H.R.H. Princess Margaret, nor I. Fossett's Dove—fastest aircraft in the race with laps at 192 m.p.h.—were successful. The Proctors, Mentor and Falcon Six had a good battle: Lashbrooke (Proctor III, 153.75 m.p.h.) was placed first, Dunkerley's Gemini second (142 m.p.h.), Turnill in the Mentor third (149.25 m.p.h.), and Rush, Falcon, fourth (158 m.p.h.). Limit man, W. H. Moss, Mosscraft, did well to hold fifth place at 126.5 m.p.h. The heats all produced some spectacular dashes for the finishing line, particularly for the places.

Handicaps being unaltered, Somers was obvious favourite for the final, having gained most on his lap times. "The Peter Masefield system" did not, however, forecast the other places correctly, though Milli appeared favourite for second and Lashbrooke for third. Eight finalists out of thirteen flew Miles aircraft. Cole in the Comper Swift took off first and R. Paine in the Hawk Speed Six was scratch man.

As expected, Somers from the beginning picked up places with each lap and finally came in an easy winner at 164.25 m.p.h. The removal of the Gemini's wind-driven generator and venturis, and the fairing-over of even the steps on the flaps had caused a remarkable improvement in performance since the machine's first race—at Wolverhampton earlier this year.

For the spectators, the excitement in the final was in following Cole and Milli as they strained to keep ahead of a quickly closing field. Paine and Dunkerley were flying fast and smoothly, but the Speed Six in particular appeared to have a long distance to pick up. As Somers crossed the line a good bunch of machines could be seen as dots rounding the last turning point, and keen eyes could distinguish Cole and Milli as the leaders. By his speed Paine was seen to be overhauling the tail end as he went into the turn, and then began the dive for the finishing line. With no more than feet to spare Paine swept into second place, having averaged 184 m.p.h., robbing Cole, who had maintained 126 m.p.h.

Dunkerley just beat Milli into fourth place, and the Chipmunk held on to sixth at 139.5 m.p.h. Lashbrook, Turnill and Alington took seventh, eighth and ninth places in quick succession, and the rest followed on. Oliver, who unfortunately had a panel blow out of his Gemini's enclosure, pottered in at the end. Somers' runaway win, fine as it was, necessarily detracted from the excitement: but the tussle for the place prizes made the Kings Cup Final a good race.

KEMSLEY CHALLENGE TROPHY RACE. This event was held on Saturday, after the heats and before the final of the King's Cup. T. W. Brooke-Smith (Sturgeon) having withdrawn to fly the Sealand in the King's Cup final, the field was: P. G. Lawrence (Firebrand 5), G/C. A. H. Wheeler (Spitfire 5), J. W. G. Morgan (Spitfire Trainer), R. W. Jamieson (Hornet 3), F. Murphy (Sea Fury Trainer), John Cunningham (Vampire 3 with Goblin 4), and Neville Duke (P. 1040).

Lawrence was away well before the jets rumbled into life and, exploiting the Firebrand's powered ailerons and moderate wing-loading by turning in an exceptionally small radius, was well into his second lap before the Vampire was airborne. The cornering of the jets and the Sea Fury was exceptionally fine: vapour flashed off the 1040's wings and tip-trails momentarily marked the Sea Fury's path. So tightly was Murphy pulling his compact two-seater round that on his second lap at the Coleshill pylon he blacked out and in easing off *g* lost a valuable second or so.

On the last lap, with sodiums marking all turns, the field was bunching fast, and the almost uncanny accuracy of the handicapping became fully evident. Coleshill past, and the 1040 moving down through the midst of its straining rivals, even the best-governed pulses quickened. Before reaching the railway just short of the airfield, Cunningham (with Dr. Mach, as he later said, staring him in the face) saw the sleek Hawker slipping ahead on his right. He himself passed the Sea Fury over the rails.

The thrill of the finish will remain an indelible memory, with Duke superbly snatching victory from Cunningham in the last few seconds and with Murphy a brilliant third.

Average speeds and times for the four laps of all-out flying tell their own story: Duke, 508 m.p.h.; Cunningham, 470 m.p.h.; Murphy, 340 m.p.h.; Wheeler, 319 m.p.h.; Morgan, 320 m.p.h.; Lawrence, 296.5 m.p.h.; and Jamieson 352 m.p.h. Duke's fastest lap—the last—was 562.569 m.p.h.

R.AUX.A.F. INTER-SQUADRON RACE. The Meteor 3 of No. 500 (County of Kent) Squadron being weather-bound at base (especially regrettable this, as the Gloster entry had been withdrawn from the Kemsley and S.B.A.C. events), the Vampire 1 of No. 501 (County of Gloucester) Squadron, piloted by F/O. E. B. Smith, was the sole jet participant in this event, the only race held on Sunday. Spitfire 22s were flown by F/O. A. B. Mercer, F/O. J. Baxter and F/O. W. Bowden, representing No. 610 (County of Chester), 607 (County of Durham) and 502 (Ulster) Squadrons respectively, and there were two Spitfire 16s (S/L. H. S. L. Dundas and Plt. 1 R. Yule) from No. 601 (County of London) and 612 (County of Aberdeen) Squadrons.

The Vampire was opening up for take-off as Bowden's Spitfire, going strongly, approached the Airport Turn. Some of the Spitfires—possibly due to the stiff wind—were turning wide, but the Vampire, completing its first lap as some of the piston-engined fraternity were entering their third, was getting round in splendid style, lapping at something like 470 m.p.h. and fast gaining time. Especially pretty was its third turn—banked absolutely vertically.

At this point Dundas was reported as holding the lead. Bowden, however, appeared to gain on the Coleshill Turn, and on the home stretch he was well out in front, but with Smith's Vampire, at over 500 m.p.h., fast bearing down on him. Even at this rate, however, the jet was to fail, and Bowden came in to win the day for the Ulster Squadron. He was borne off in triumph in the ceremonial Daimler as his average speed was announced as 325 m.p.h. Though the Vampire's average was 446 m.p.h. it was clocked on its fastest lap at 484.5 m.p.h.—good going for an elderly Mark 1 Vampire. Mercer had taken his Spitfire round at 331 m.p.h.

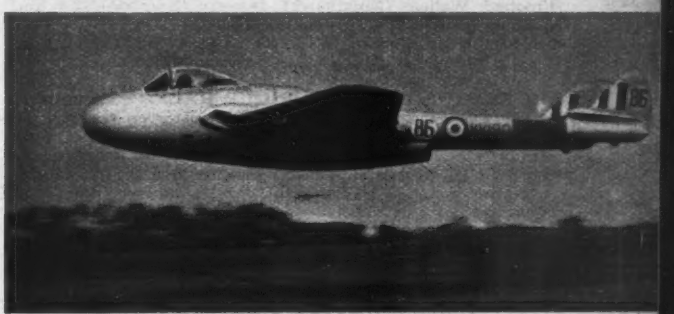
The Auxiliaries having landed, Wade took the P.1040 out for some practice laps: one he completed in 2 min 11.2 sec, at 557.4 m.p.h., and a second in 2 min 11.4 sec, at 556.7 m.p.h. Later John Derry, in the D.H.108, completed a lap in 2 min 8.7 sec, at 568 m.p.h.—a remarkable performance over a quadrilateral course with four steep turns. Later in the afternoon the Czech and French contingent put in a few practice laps.

SIDDELEY CHALLENGE TROPHY RACE. Monday's racing began with this three-lap event for club light aircraft, and it provided one of the most exciting finishes as well as some exemplary flying. F. Dunkerley of the Lancashire Aero Club brought the blue and silver Gemini into the lead on the last 100 yards. E. Ross in a Redhill Club Hawk—also silver and blue—snatched second place by diving to ground level on the line, and Jackson in the local Midland Aero Club Autocrat managed to hold third place. Speeds respectively were 144.5 m.p.h., 120 m.p.h. and 113 m.p.h. Martin Sharp, the limit man in the solitary Tiger, was too heavily handicapped to finish in the bunch. Heppell in the Newcastle Autocrat and Miss Curtis in the West London Proctor tied for fifth place.

NORTON GRIFFITHS CHALLENGE TROPHY RACE. After several uneventful, well-contested races during the week-

Mr. Ron Paine's Hawk Speed Six finishing second in the King's Cup race

S/L. Lashbrooke's gay Percival Proctor—first in the third King's Cup heat



Flown by John Cunningham, the de Havilland Vampire 3 (Goblin 4) eliminates its undercarriage-drag without a second's delay

Duke sets out in the Hawker P.1040 (R-R. Nene). (Below) The Czech victor in the Norton Griffiths Race—the Aero 45 (Jan Anderle)

The National Air Races . . .

end, this international handicap provided several incidents, fortunately none of a very serious nature. Jim Mollison took off first in the old Cygnet, and Somers in his King's-Cup-winning Gemini was scratch man. French Norécrins and the Czech Aero 45 were among the fastest entrants.

First trouble was when A. Cdre. Oliver was unable to get his port wheel to lock up after take off. He took off almost in formation with Tommy Rose's Gemini and S/L. Bradshaw in his Proctor *Kiwi Wanderer* with overload fuel tank. On the first lap, between Corley and Coleshill, Somers lost his starboard airscrew and was most fortunate to be able to return to the airfield for a normal landing on one engine, with the aircraft's nose damaged. On the second lap W. P. Bowles, flying with his wife, also lost the airscrew off his Messenger and made a forced landing between turning points. News came through at about the same time of the first disqualifications—those of Bradshaw and Oliver, who cut pylons too close.

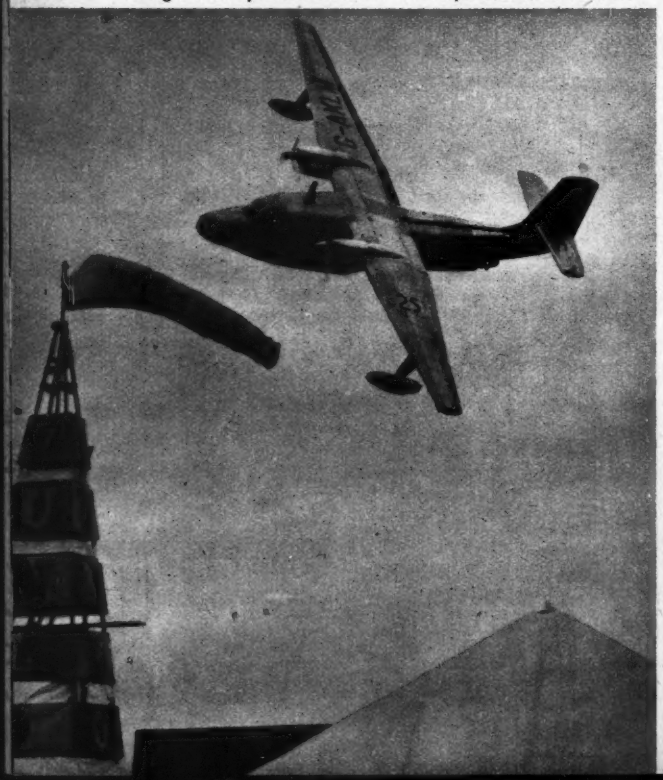
Competitors who were going well were Tommy Rose (Gemini) the ivory Norécrin flown by F. Duperre, and Rush on the Falcon with its healthy crackle. The Aero twin also looked promising, competently handled by Jan Anderle, veteran Czech test pilot. On the last lap it seemed that Peter Lawrence on his Cirrus Major Messenger was coming into the picture, but as the aircraft came into view on the final straight, with weather and visibility deteriorating, it was Anderle on the Aero 45 who moved quickly and unexpectedly into the lead. Rush, Falcon Six, came in second and Purvis in the Proctor was a good third. Stuart (Proctor), Wallens (Nighthawk), Duperre (Norécrin) and Rose (Gemini) followed in very quick succession.

Speeds were: Aero 45, 163 m.p.h.; Falcon Six, 159.5 m.p.h.; Proctor, 148 m.p.h. The Norécrin averaged 162.5 m.p.h.

AIR LEAGUE CHALLENGE CUP RACE. Starting order for this event, which was restricted to piston-engined aricraft with a sea-level top speed in excess of 250 m.p.h., was A. E. Gunn (Balliol 2), P. G. Lawrence (Firebrand 5a), T. W. Brooke-Smith (Sturgeon 1), G/C. A. H. Wheeler (Spitfire 5), E. S. Morrell (Sea Fury Trainer) and G. H. Pike (Hornet 3). Gunn, who, in practice flights had flown extremely well, somehow got off course on the first lap, at the end of which Lawrence was ahead, tailed by the Sturgeon (smoking and noisy, but doing well), Wheeler's beautiful blue Spitfire, the Balliol and the Hornet. Morrell missed a pylon and dropped out of the race.

At the end of the second lap the order was Firebrand, Sturgeon (lower now, and with the Spitfire overhauling it on the turn), Hornet and Balliol. Next time round Lawrence, flying with admirable consistency, appeared to have gained some 16 seconds; Spitfire, Sturgeon and Hornet were still going strongly and the Hornet passed the Balliol on the Airport turn.

A tight turn by Brooke-Smith in the amphibious Short Sealand



G/C. Peter Townsend, pilot of the Miles Whitney Straight entered by Princess Margaret in the King's Cup race

After Coleshill, on the finishing stretch, the Firebrand's silhouette was first into view, and Lawrence came home to a thoroughly-earned win. His average speed was 302 m.p.h.; the Hornet went round at 352 m.p.h., the Spitfire at 313 m.p.h., the Sturgeon at 295 m.p.h. and the unlucky Balliol at 234 m.p.h. On one lap—possibly that on which it collected a bird—the Hornet had been clocked at 368 m.p.h.

THE GROSVENOR CHALLENGE TROPHY RACE. Of 18 entries for this event, Kemp's Tiger Moth and Douda's Hodek were non-starters. For the first—in fact the greater—part the weather was truly appalling, with rain, bumps, and forbiddingly low visibility. Blunden's Piper Cub, nevertheless, got away to time—nearly 16½ minutes before the limit man. Conditions were even worse when Bilbrough's Chilton, the second off, hummed down the wet runway at the drop of the flag. The rest of the field headed out into the grey in the following order: Hughes (Tiger Moth), Mole (Bibi), Donaldson (Taylorcraft), Evans (Tiger Moth), Lawrence (Blackburn B.2), Arch (Autocrat), Harrison, McCaskill and Leadbetter (Auster Vs), Oliver (Goodyear Duck), Miss Curtis (Ercoupe), Vanek (Sokol), Bradley (Globe Swift) and Moore (Saab 91 Safir). The Swift failed to get its wheels fully up but pressed on with a heavy drag penalty. Oliver's Duck soon returned and landed on the grass alongside the runway.

When all remaining machines had passed the Airport turn, having completed a lap, the Ercoupe was reported to be shaping especially well, though this promise was not fulfilled. Distantly an unidentified hero was glimpsed popping in and out of cloud. The Bibi, which seemed to have benefited from a night out in a field, after an emergency landing during practice, was surely closing up towards the end. There was, nevertheless, a great deal of uncertainty at Elmdon as the leaders passed Coleshill in clearer weather. A swarm of ten machines became visible, with Arch's red Autocrat, it transpired, out in front and diving for the line. This proved to be a popular (especially with the Midland Aero Club), if unexpected, winner. Next came the Bibi, and third Lawrence's faithful old B.2, which, wheels almost skimming the runway, was duelling stoutly with a Tiger Moth. Arch's average speed was 112.5 m.p.h., Mole's 104.5 m.p.h., and Lawrence's 109 m.p.h.

S.B.A.C. CHALLENGE CUP RACE. Twice during Monday afternoon John Cunningham had ventured out in the Vampire on met. reconnaissance; "the world's fastest race" was to be flown, unless conditions proved impossibly hazardous. At length, when hope seemed slight, a somewhat clearer patch of weather began to show up and the race was officially declared "on." Cunningham's Vampire 3 (non-standard in having a Mark 4 Goblin) had a 1 min 3 sec start from the scratch man—the redoubtable John Derry with the closed-circuit-record-breaking D.H.108. Trevor Wade, in a P.1040, was a mere 16 sec ahead of Derry. Wheels were up without a second's delay; for the high-Mach champions were giving no concessions.

First round the airport pylon, Cunningham was flying to his wonderfully precise form; but Wade was closing on him at tremendous speed. The 1040 cornered at some formidable *g* loading, screening itself in a shuddering, spanwise vapour haze and evoking gasps of astonishment—and, truth to tell, apprehension. "Wimpey" was in grim earnest. Derry gave a similarly shattering display of vapour-precipitation, though he appeared to be losing ground to the straight-winged Hawker.

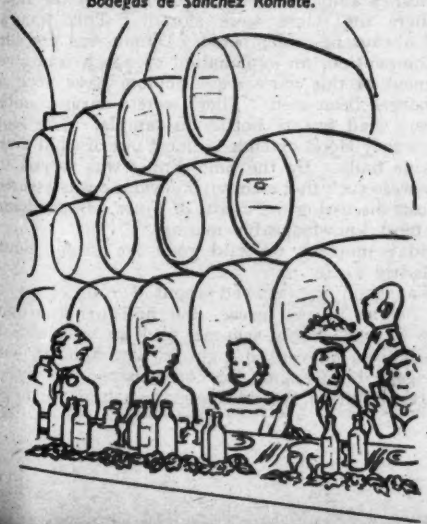
The climax neared: Wade and Cunningham levelled out from the Coleshill Turn, and now it could be seen that the Hawker, at better than 600 m.p.h., had the lead. But barely had Wade started his pull-up from the finishing line than the Vampire (travelling, we suspect, about as fast as any machine of the type has flown) was home to second place. Derry—later reported to have been troubled with an insecure wheel-cover—flashed over and Wade rolled victoriously. Thereupon—as on previous days—Jeffrey Quill mounted the 1909 Bleriot for a 35 m.p.h. passage.

Wade's average for the four-lap course was 510 m.p.h., Cunningham's 470 m.p.h., and Derry's 488 m.p.h. One lap had been flown by the P.1040 at 562.5 m.p.h.

Control building at Haya Airfield, right, and below, the gardens and living quarters at this Spanish Air Force Station situated near Jerez de la Frontera.

(Below) The Los Cisnes Hotel at Jerez.

An impression of the barrel-lined dining hall at the Bodegas de Sanchez Romate.



INTRODUCTION TO SPAIN (Part two)

By Wing-Cdr. MAURICE A. SMITH, D.F.C.

IT was on the trip to Madrid that some people were compelled to break schedule. One aircraft overflew and its occupants spent the night very happily, we were informed, at an Air Force station; some others who left Valencia rather late ran into storms and turned back. G/C. Mole's Argus had severe plug trouble and arrived late, and the little Aeronca flown by Mr. Gooch and Mr. Boyd was held up for repairs.

On this little machine the Spanish mechanics welded a damaged tail skid and also removed the starboard pot of the engine for valve grinding, leaded fuel having attacked the valves and reduced compression to nil. The Magister owned by Mr. De Vere, and the only open-cockpit aircraft in the Rally, later fell a victim to leaded fuel trouble and the revs and power of the Gipsy engine were barely sufficient for take-off on the last day.

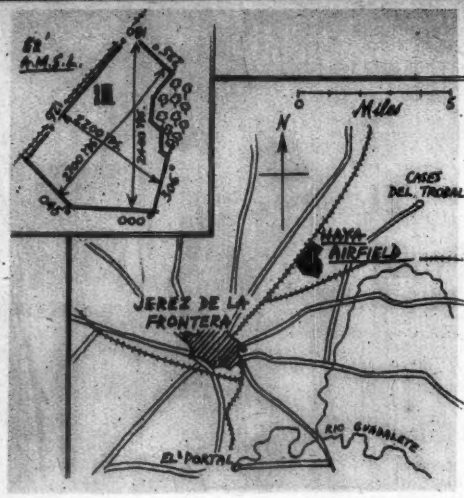
Thursday morning we travelled to the airfield early to take off for Jerez, but it proved to be our unlucky day. First the taxi driver lost his way and we had covered several uncomfortable and unnecessary miles on by-roads before we could get him back on to the correct road. At the aircraft park we immediately noticed a blue Gemini looking distinctly tail-down, and it did not take long to identify it as ours.

This was where our fellow countrymen rallied round. Mr. Ron Paine, of Wolverhampton, at once offered his help as he had done to many other people, and a small air bottle was produced from a Derby Gemini and gauges and connections were found among my few tools and spares. The absence of one small but essential union was the first set-back and we were forced to appeal to the local Air Force fitters. While they were away Doug Catton and Jack Bidgood, seasoned rallyists, produced a huge air bottle and connection which blew up the tail-wheel leg in a moment. It was a wonder their Messenger could lift so large a bottle. Finally, as the tail fairing was being replaced, two Spanish erks panted up with an even larger air bottle. We could only reward their efforts with thanks and a much-prized English cigarette.

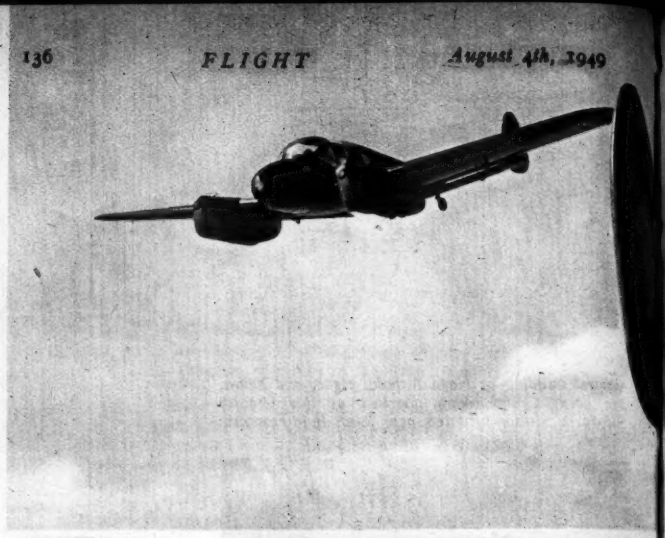
Ron Paine, ever helpful to all pilots, is a great enthusiast and a great asset to his club. He is always ready to extol the virtues of all aircraft from Wolverhampton, and to indicate the well-nigh insuperable handicap under which a machine from any other stable must labour. We gratefully accepted his aid and were not unduly discouraged, for after all quite a number of aircraft from other clubs contrive to remain airborne.

Before loading the luggage into the nose compartment I topped up the batteries with distilled water carried from England for the purpose (considerable evaporation occurs in hot climates) and then we enplaned and prepared to depart. However, on turning the starboard engine by hand after priming I found that there was no impulse. The usual blacksmith's remedy was partially successful and the little Minor condescended to start without hesitation, followed by its fellow on the port side.

The flight to Jerez, apart from being the longest single hop, took us

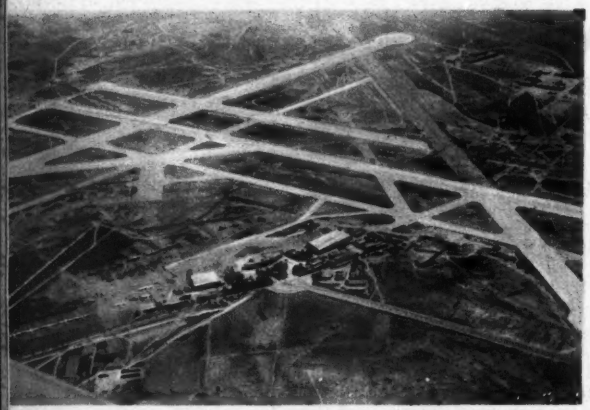


Haya Airfield—position and plan.



Our companion on the long flight back to Madrid. The pilot was Mr. Bayliss.

INTRODUCTION TO SPAIN



The impressive Barajas Airport which serves Madrid.

(Below) Rugged country between Madrid to Pamplona.

The young men of Pamplona crowd the bull ring to show their mettle. Horns are padded.

over very mountainous and uninhabited areas. Again reliable landmarks proved few and far between, but the weather was good and we had an excellent early pin-point on Toledo, a picturesque old city which, according to our log, came up at 1235 hr, some twenty minutes after take-off. We saw little except mountains, rivers and valleys for about half an hour, and then we took a fairly reliable contour fix near a village named Fontanarejo. Later we found a row of three villages and a curve in a railway line near Fuente la Lancha. After that Belez (1338 hr), the River Guadalquivir (1402 hr), Seville to the starboard and Utrera (1416 hr) appeared on track and E.T.A. and we ceased to worry more about our course.

Nearing Haya airfield, a training station of the Spanish Air Force, just north of Jerez de la Frontera and our destination for the day, we were somewhat surprised to see a large hawk hovering at our level of a little over 3,000ft above ground. He made no attempt to avoid us, so in view of his size we thought it best to take the evasive action.

On landing at Jerez we were greeted by several officers in their white uniforms and conducted to the dazzling white control building for a drink. This was more like the Spain I had imagined—picturesque ranches and buildings with palms and lush green foliage round them, but elsewhere dry, sandy earth, a few eucalyptus trees and huge, prickly cacti often set in rows to keep the mules and hinnies from straying.

The evening at Jerez was one of the most enjoyable of all. We stayed at the delightful modern Los Cisnes hotel with its cool patio and garden of brilliant flowers and creepers. Others, not so fortunate, went on a long journey by coach to Cadiz for accommodation. Before siesta-ing we looked round the shops, followed at every step by at least a dozen scruffy but attractive children. Even some of the smallest shops offered first-class Swiss gold watches, clothes and such things as chandeliers for a great deal less than would be charged in this country.

That evening we walked to the *Bodegas de Sanchez Romate, Hnos.*, where we sampled sherries and brandies before dinner in the huge, barrel-lined halls where the wines were stored. This was an experience which will always be remembered. Dinner was preceded by the wine-tasting competition, an explanation of which was given in last week's instalment of this narrative. Seldom have such an impressive array of bottles been seen. There were a large number of competitors and each had twenty bottles to sample. The long, narrow tables on which they stood extended almost out of sight down the huge, dimly-lit wine halls. By the time dinner was served the spirits of the company were such that a convivial evening was assured, and one heard the guests discussing the merits of *Finos, Amontillados* and *Olorosos* in the most knowledgeable manner.

Reluctantly on Friday morning we said good-bye to the South and set course for Madrid again.

The met. report was good but showed about 8/10th of cu. at below mountain-top height in two areas, the first being around Seville. It proved to be remarkably accurate and we were able to avoid all cloud and enjoy an uneventful flight back to Madrid, with Mr. Bayliss, formating in his Gemini, for company.

It was remarkable that during the whole Spanish tour we never

Introduction to Spain . . . .

experienced a head wind but frequently had a light following breeze. The only time we had to think about drift was on the last and most difficult leg to Pamplona when a variable beam wind tried to put us off track. Another feature of the flying was that, speaking in general, the air was a good deal smoother than one would have expected, bearing in mind the heat and mountains.

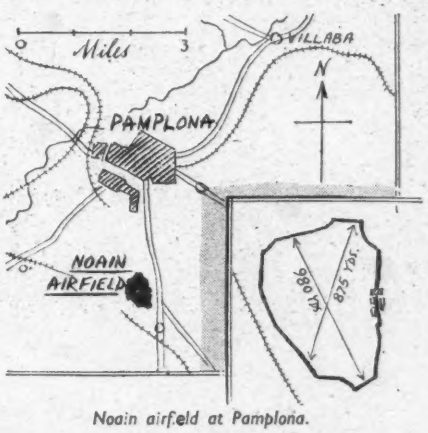
On this Friday flight north to Madrid we flew through one rough patch between the Toledo and Porzuna mountains, but there was a period of spectacular lift which in a few minutes carried us up from about 5,000ft to over 7,500ft into smooth air. There was a corresponding down-current area a little later which made the Gemini feel as if it were labouring under an overload.

There were no official functions during our second day in Madrid, so we spent an enjoyable evening looking round the city and its shops. Later, after an excellent dinner in the Garden of the Ritz Hotel, we had our first early night of the tour. It was as well we did, for there was no sleep to be had in Pamplona.

At this time we heard more of the excellent and generous services rendered by the three doctors in the British contingent, Drs. Hamp, Ryan and (Mrs.) Ercolani. Fortunately, there was no serious illness but several people suffered from throat troubles and internal upsets.

On Saturday everyone took off for the last 200-mile "hop" of the rally to Pamplona on the North-Western border of Spain inland from San Sebastian. Weather was again excellent and we were able to establish our course as we passed over Madrid with its vast bull ring and over Barajas, the principal airfield to the North-East of the city. After this we flew for a hundred miles without a single reliable fix, and were somewhat relieved to find Soria coming up in its right place to starboard. There was a certain amount of cloud to cope with on the last part of the journey, which took us between several 6,000ft and 7,000ft peaks in the Moncaya Mountains, and we were pitched about for a while as we finally descended towards Calahorra and Larraga which gave us our two final fixes before Pamplona showed up ahead.

Noain field was the smallest we used during the rally, and it was reputed to allow a 900-metre run in the direction of the prevailing wind. It is situated a few kilometres south of Pamplona at an altitude of about 1,500ft above sea level.



Noain airfield at Pamplona.

Our stay at Pamplona during its week's festivities of San Fermin was completely different from anything so far experienced. In the first place, we were billeted in private houses and apartments. Some pilots also stayed at the seminary, and for the ladies there was the equivalent known as *Servicio Doméstico*. Meals were taken at the local hotels, and it was nothing short of miraculous how, for instance, the kitchen of the little Hotel Maisonave turned out hundreds of well-cooked meals at all times of the day and night.

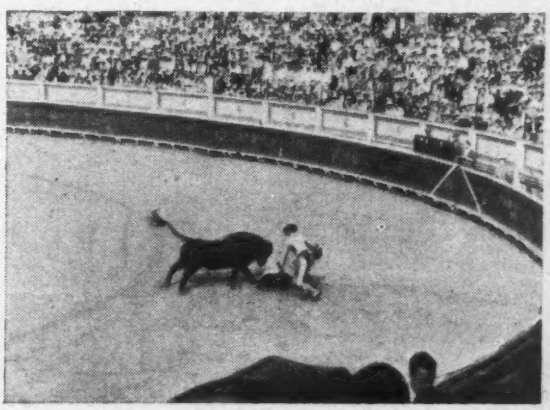
The celebrations continued non-stop and, of course, all the Pamplonians were on holiday. There were bands, parades, fireworks, a fair, and dancing, and, for the men, a great deal of thirst quenching. In addition, of course, there was the bull fighting. We saw a bit of everything in the two days' stay, and the good-natured high spirits and tirelessness of the young Spaniards impressed us very much. To express a personal opinion: the fireworks were the best I have seen and the killing of bulls was revolting. The chasing about and clowning with young cows which went on in the bull ring early on the Sunday morning was most amusing.

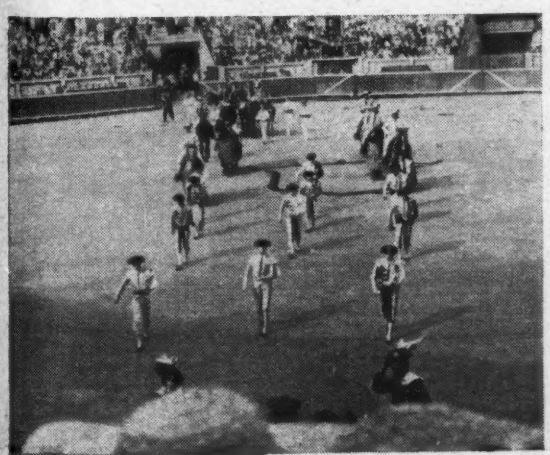
Later on the Sunday there was some flying by the enthusiasts, and Messrs. Rice, Hickman and Larsen gave rides to several Franciscan monks who were their hosts at Pamplona.

On the Sunday evening there was a farewell reception and dinner at the most impressive premises of the tennis club at Pamplona. A threat of rain, following our experience at Madrid, led the Duke to order dinner indoors (in the Pelota courts).

Most handsome and generous prizes were presented, and Aero Club members, and in particular our Gemini, were particularly fortunate. The principal flying prizes were for regularity and navigation during the week's tour, log books having been collected for examination on arrival at the airfield. France (Norecrin F.BEBE flown by M. and Mme. Prost) received one principal prize, England (Gemini G-AFLT) a second. Aircraft team prizes went to Italian Iacchi 308s and French-flown Sokols, and Mr. Larsen and Mr. Thomasson, of Denmark, in their KZ-III were also prize-winners. The wine-tasting competition

Some snapshots taken in the bull-ring at Pamplona during the performance to which all Rallyists were invited. Below is the opening procession of "matadors," "banderilleros" and "picadors" attended by their "chulos." (Upper right) The process of tiring and teasing the bull begins. So far his only injury is caused by the pin which attaches a rosette to his shoulders. (Below) A second pair of banderillas is skilfully emplanted as the bull charges.





Introduction to Spain . . . . .

was won by an English entrant, Mr. W. W. Lyle, who flew a Proctor in the rally. In addition to the attractive prizes illustrated we were also presented with a cask of sherry.

A representative of each country made a brief speech of thanks after the Duke of Almadovar had addressed his guests. He again stressed that all would be welcome if they would return to Spain. The rally was organized "to help all nations to know and love Spain, and its success this time belonged to rallyists as much as the organizers." Sr. Antonio Archanco, Tennis Club president, also spoke. Count Bonzi replied for Italy; Direktor A. Strange Hansen for Denmark; Mr. Mariage for France, and Mr. Kenneth Davis for England. Mr. Houlder was loudly cheered after adding his thanks for associate Aero Club members in the Spanish language. "Jolly Good Fellow" was sung for the Duke, and the Yorkshire boys sang him a verse of "Ilkley Moor B'aht 'At." On the Monday morning there was great activity at the airfield from an early hour, and the Duke was there to see that all went well and to say "Adios" to us as we took off to return to our various countries, to continue on a holiday tour or, in the case of some British pilots, idle up the French coast to La Baule for the next rally on the following week-end. Some people had a long wait for their passports, but neither at Pamplona nor any other place did we hear of any difficulties with customs. There was no examination of the luggage, and the aircraft carnets were stamped in a most orderly manner. Representatives of the Shell and Esso fuel companies had also arrived in good time, and the signing of fuel forms and returning of fuel carnets caused the minimum of delay considering the number of aircraft and the variety of languages spoken by the pilots. And so a most enjoyable and instructive *Raid Aero Internacional de Espana* terminated.

Three most attractive prizes won for regularity of flying during the week's tour by "Flight's" Gemini. In addition to the cup, bull and cigarette case a cask of sherry was presented. Some similar prizes were won by other contestants.

THE NEW C.A.S.

AT the end of this year, announces the Air Ministry, Marshal of the Royal Air Force Lord Tedder, G.C.B., D.C.L., LL.D., will relinquish the post of Chief of the Air Staff, at his own request, in order to facilitate the advancement of younger officers.

The King has been pleased to appoint Air Chief Marshal Sir John C. Slessor, G.C.B., D.S.O., M.C., A.D.C., to succeed him.

Lord Tedder, who is 59 years of age, was educated at Whitgift School, Croydon, and at Magdalene College, Cambridge; he joined the Dorset Regiment in 1913 and was seconded to the Royal Flying Corps in 1916. He fought as a pilot in 25 Squadron, and later commanded 70 Squadron, being mentioned three times in despatches.

In 1919 he was granted a permanent commission in the R.A.F. with the rank of Squadron Leader, and commanded in succession 274 and 207 Squadrons. Subsequently, he held a series of training appointments, culminating in his appointment as Director of Training at the Air Ministry in 1934. He went to Singapore in 1936 as A.O.C., Far East Command, returning to Air Ministry in 1938 as Director-General of Research and Development. After the formation of the Ministry of Aircraft Production he became Deputy Air Member for Development and Production in that Ministry.

In June, 1941, Lord Tedder was appointed A.O.C.-in-C., Middle East, and subsequently became Air C.-in-C., Mediterranean Allied Air Forces, on the establishment of that command in 1943. During his tenure of the principal air commands in the Mediterranean, there took place the great build-up of allied air power, the effect of which was seen in the operations leading up to the final expulsion of the enemy from the African continent, the occupation of Sicily and the invasion of Italy.

He left the Mediterranean in early 1944 on appointment as Deputy Supreme Commander of the Allied Expeditionary Force under General Eisenhower, and on January 1st, 1946, he was appointed Chief of the Air Staff in succession to Marshal of the Royal Air Force Lord Portal of Hungerford.

Sir John Slessor was born in India in 1897, was educated at Haileybury and joined the R.F.C. in 1915. During the first world war he saw service in France, Egypt and the Sudan and was Mentioned in Despatches and awarded the M.C. for his services. He was granted a permanent commission in the Royal Air Force early in 1920.

He held various appointments during the nineteen-twenties and early thirties and in 1936-37, as a Wing Commander, he took part in the Waziristan Operations in command of No. 3 Indian Wing of the R.A.F. During these operations he was awarded the D.S.O. and Mentioned in Despatches for his gallant and distinguished services. In 1937 he returned to the Air Ministry to take up the appointment of Director of Plans, a post which he held for some four years. In 1941 he was promoted to the rank of Air Vice-Marshal and left the Air Ministry to take command of No. 5 (Bomber) Group.

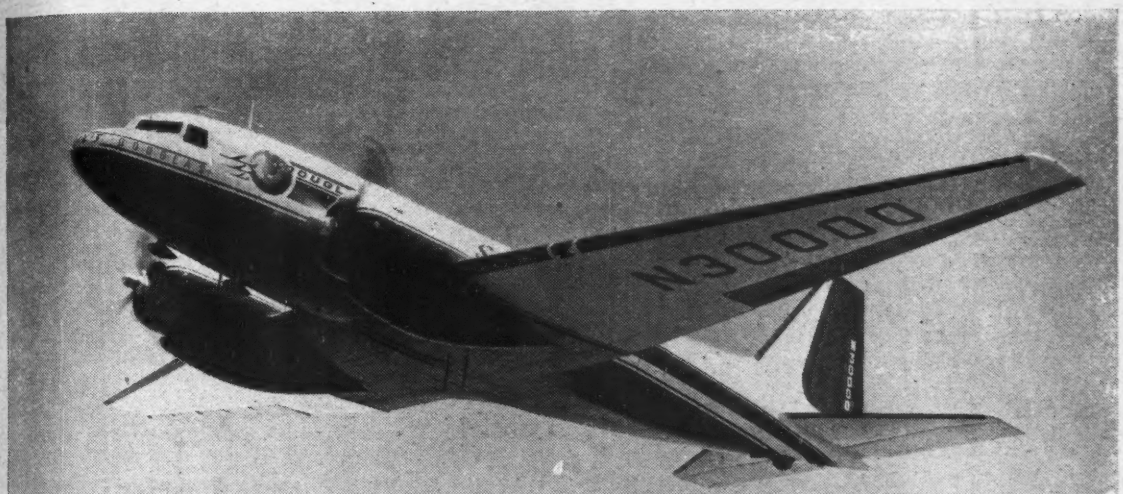
In February, 1943, he was promoted to the acting rank of Air Marshal on being posted as A.O.C.-in-C., Coastal Command. He left this appointment in 1944 to become C.-in-C. of the R.A.F. in the Mediterranean and Middle East and Deputy to General Eaker, Commanding the Mediterranean Allied Air Forces, a post which he held until April, 1945, when he was called home to take up the appointment of Member of the Air Council for Personnel.

This latter appointment he held until the end of 1947, when he was posted to succeed General (now Field-Marshal) Sir William Slim as Commandant of the Imperial Defence College, the post which he now holds.

WAKEFIELD CUP COMPETITION

SEVENTEEN countries entered teams for the 1949 Wakefield Trophy model aircraft contest held at Cranfield on Sunday, July 31st. This annual competition is truly international and the trophy is awarded for the longest endurance achieved in a single flight by a rubber-powered model, the award going to the team of which the winner is a member. Organized on a challenge basis, the event is held in the country whose team are the current holders of the trophy. R. B. Chesterton won the trophy in 1948 for England.

The weather at Cranfield on Sunday was far from ideal, and competing models had to contend with a variable wind gusting up to some 30 m.p.h. The longest duration—549.9 sec.—was recorded by a ten-year-old model entered by a Finnish student, Aarne Ellila; he was the only entrant from Finland. Second was an Italian, Edgardo Sadorin, whose model remained airborne for 539.7 sec., and third was Warren Fletcher, an American, whose time was only a fraction of a second less. The British team were ninth. R. B. Chesterton, who, as mentioned above, was the winner last year, recorded three flights of 300 sec. each in trials, but during the competition his best were only 151 and 109 sec., and on the third flight his model crashed. Figures are subject to confirmation.



CIVIL AVIATION NEWS

MORE OF EVERYTHING: The Douglas Super DC-3 first flew on June 23rd. Designed to give a greater all-round performance than the well-known DC-3, the company's standard modification, including two new engines, costs $200,000. With a crew of three, accommodation can be provided for 30 to 38 passengers and a payload of 12,900 lb is claimed with Wright R.1,820 engines, or 10,550 lb with Wright R.2,000 engines.

Charter Companies' Replacement Problem : R/T Experiment in Scotland : Special Radio Overhaul Base

OUT OF REACH

BRITISH charter companies, faced with the problem of replacement when I.C.A.O. standards become effective in 1952, look with envy upon the Douglas DC-3 modifications. The greater payload, range and speed of the Super D.C.3, coupled with the background of proved DC-3 performance over many years, make it an ideal replacement aircraft for the medium-sized British charter concern. In the present circumstances of dollar shortage, however, it is unlikely that the Super DC-3 will be available to any British, or for that matter European, operators unless, of course, special arrangements can be made for the modifications to be made in this country and British engines substituted. In addition to the direct benefits in performance, the fact that the basic design is already familiar to flying crews and maintenance staff throughout the world represents a distinct advantage over an entirely new type. Moreover, those DC-3 spare parts which will be common to both the old and the modified model, are already distributed along the air routes.

The first prototype flew on June 23rd and the company have planned a demonstration tour in the United States to allow interested airlines to make their own preliminary performance tests.

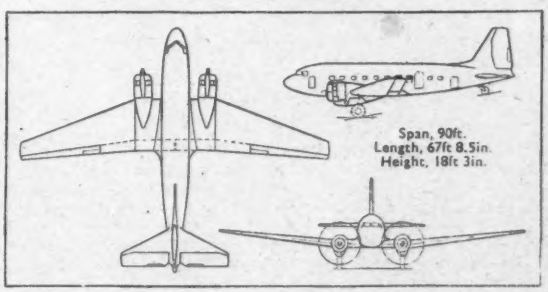
METEOROLOGY OF AIRFIELDS

PUBLISHED by the Meteorological Office through H.M. Stationery Office and written by Mr. C. S. Durst, B.A., *Meteorology of Airfields* is a book designed to show in what way meteorological data could be useful for airfield siting and designing. The book, which may be purchased for 2s, states the principles which have been applied in giving advice on the siting of airfields, and gives statistics which at least are a sample of the data available. In separate chapters the book deals with visibility, cloud, flying-fitness figures, precipitation, wind, pressure and temperature, stating in each case the way in which a site may be affected and the frequency of occurrences related to the physical causes. Examples have been taken from data collected in all parts of the world, particularly those which were the scene of operations during the last war. Tables of the frequencies of poor visibility and low cloud height at many of the principal airfields in the world are included in the appendices.

A.O.A. STRATOCRUISER

THE *Flagship Great Britain*, American Overseas Airlines' first Stratocruiser, arrived at London Airport on July 23rd, and after demonstration flights over the U.K., Holland and Switzerland, left again for the United States on July 28th. Except for the interior colour scheme, which is a pale shade of grey throughout, with light blue upholstery, this airliner is a standard 60-seater, similar to the one described in *Flight* of April 14th. One external feature which distinguished it from other Stratocruisers at London Airport was the Curtiss electric constant-speed airscrews, since other models have been fitted with Hamilton Standard paddle-bladed airscrews. In a flight over Southern England we were able to confirm our earlier impression of precise and sensitive control in flight. It is perhaps unique that the A.O.A. drill for landing the Stratocruiser is to use 25 degrees of flap in the circuit, which allows the speed to be reduced safely to 125 knots, and to keep the undercarriage retracted until the final approach is started. Although

SUPER DC-3

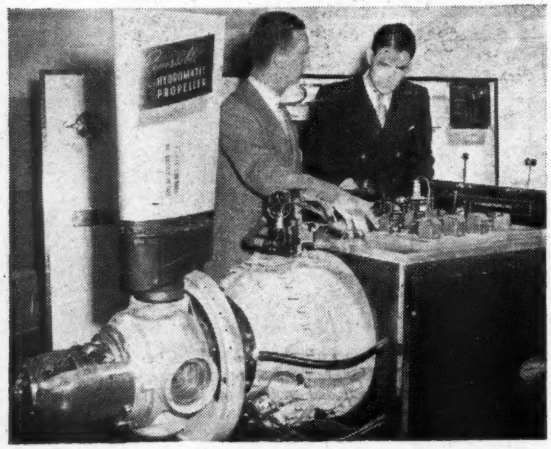


Civil Aviation News . . . . .

regular services with Stratocruisers will start on August 19th, A.O.A. Constellations will continue on the North Atlantic route until the entire fleet of Stratocruisers is in operation towards the end of the year.

M.C.A. RADIO TESTS

TESTS of HF R/T communications arranged between the Ministry of Civil Aviation, Scottish Division, and Trans-atlantic airline operators have been going on for some time. The results are understood to have been satisfactory and within a short time HF R/T will probably be in use operationally over the North Atlantic. It is intended to use the Scottish Divisional Signals Centre at Redbrae, Prestwick, as the receiving station and to transmit from Galdenoch, near Stranraer.



B.O.A.C. PREPARATION: Capt. J. W. Burgess, who has been appointed Flight Captain of the B.O.A.C. Stratocruiser Line, receiving instruction at the Boeing Training School at Seattle, Washington. He is no stranger to Boeing aircraft as during the war he flew transatlantic Boeing flying-boats.

M.C.A. technicians are at present in Canada studying long-range R/T communications as used for civil flying in that country.

With the object of carrying out radio experiments in VHF R/T, M.C.A. signals technicians and members of the Mountain Rescue Unit from R.A.F. Station Kinloss, were due to spend last week-end on the summit of Ben Nevis (4,406ft). It was intended to carry packs of mobile radio equipment and establish a VHF R/T transmitter and receiver station on the mountain in order to test, with the assistance of M.C.A. Ansons operating from Prestwick, coverage over north and west Scotland. Communications with aircraft and ground stations were to be tried at ranges of more than 100 miles. Effective VHF R/T coverage is important in Northern Scotland, particularly in the Moray Firth area where there is considerable Service and civil flying activity. A further aim of the exercise was to strengthen the liaison between the M.C.A. and the R.A.F. Mountain Rescue Unit.

NAVAL-AIR CO-OPERATION

IN the Navigators' and Engineer Officers' Union and the Radio Officers' Union the British Airways Corporations have 100 per cent representation. There is also substantial support from employees of the charter companies. Both of these unions are federated to the Officers' (Merchant Navy) Federation of which there are some 30,000 members.

In a report by the Council of the Federation for the 12 months ended June 30th, it is suggested that for vessels serving on protracted foreign service future developments in the field of air transport may make it practicable for whole ship's crews to be relieved regularly from stations abroad, in the same manner as crews are frequently being moved from one part of the world to another at the present time for the purpose of manning idle ships. The Federation believes that however revolutionary such a proposal may seem to those who in the past have accepted long periods of separation from families as being one of the normal hardships of service in the Merchant Navy, the procedure may, in time, be accepted as normal. If such an innovation could be introduced without detriment to the economic operation of shipping it will offer new possibilities of regular business for the charter companies.

Mr. H. J. Perkins has retired from the position of general secretary of the Radio Officers' Union and at a recent luncheon in his honour Mr. G. Shrosbree represented the Civil Air Transport Employers' Secretariat. B.A.L.P.A. and B.O.A.C. were represented by Mr. D. Follows and Mr. J. O. Blair-Cunynghame respectively.

ENTRY AIRPORT

WITH the recent installation of full Customs facilities at Gossalies, a new airport has been made available to private fliers entering and leaving the Continent. The airport is situated 35 miles south of Brussels on the main road to Charleroi. A new runway of approximately 1,600 yd is under construction, and will be completed by next year, to supplement the existing one which is 1,300 yd long. Amenities for air travellers will be increased as soon as possible, but already full servicing facilities can be provided by Avions Fairey. At Gossalies this company has built up a flourishing repair, maintenance, overhaul and aircraft construction organization since the war.

RADIO OVERHAULS

AIRWORK, LTD., have established a radio overhaul organization at Blackbushe Airport, the home base of the company's charter division. With the introduction of the Air Navigation (Radio) Regulations 1949-1950 it became necessary from April 1st for every passenger-carrying aircraft to have its radio equipment checked and the serviceability certificate signed by a Licensed Aircraft Radio Engineer. It was also a requirement that at least once a year, at the time of each aircraft's C. of A. overhaul, the radio installation should be removed and thoroughly serviced to the maker's standards. Such servicing should be done either by the manufacturer of the equipment concerned or by an approved radio overhaul servicing organization acting under the authority of the Air Registration Board. The new Airwork division, under the supervision of Mr. D. W. Griffiths, is fully approved by the A.R.B. and any form of servicing from single items of equipment to complete maintenance contracts may be undertaken.

BREVITIES

ON July 15th, Skyways (East Africa) Ltd., withdrew its services between Nairobi, Mauritius and Johannesburg on the grounds of uneconomic loads and the Government's decision not to subsidize the service.

* * *

Nearly 500 children have been booked to fly on B.O.A.C. services during July and the early part of August under the special school vacation return fare concession scheme. The fare charged is half the normal amount and tickets are valid for four months.

* * *

It is understood that on through bookings to destinations in Russia, Aeroflot (Soviet Air Lines) are refusing to pay commission. Consequently, at least one airline operating as far as the Russian frontier has made it known that commission will not be allowed on tickets sold over Aeroflot routes.

* * *

With effect from December 10th this year to March 31st, 1950, B.E.A. and Swissair will reduce by £4 or more the return fares between London and Switzerland. The concession is for the winter sports season and tickets will be valid for 23 days. There will also be reductions in the return fares for flights to Switzerland from Glasgow, Belfast, Manchester and Birmingham.

* * *

Yet another American business organization has bought a four-engined aircraft for the purpose of visiting the world's markets. Mr. Sam Keener, president of the Salem Engineering Co., intends to visit 33 cities in 24 countries during the next four months in a DC-4 recently purchased from United Air Lines. Last year he made a similar business tour of Europe in a DC-3.

* * *

Following an inquiry into the possibility of delivering mail and goods by air to the Isle of Coll (off the west coast of Scotland) on occasions when the steamer service was interrupted, the Ministry of Civil Aviation stated that the only air transport to the island was the ambulance service and an occasional charter flight, and that the carriage of mail and goods would be impracticable. The Argyll County Council are understood

Civil Aviation News . . . . .

to be continuing their demand for essential foodstuffs to be taken to the island by air.

* * *

On Saturday, July 23rd, 3,663 passengers passed through Kensington Air Station. Of these 2,201 were departures. Extra flights were operated and passengers and freight from 104 flights were dealt with.

* * *

Mr. Roland Gilbert, Assistant Secretary on financial policy (airfields, telecommunications and aircraft) in the M.C.A., has been appointed Chief of the Administrative Bureau of I.C.A.O. He took up his appointment on August 1st.

* * *

During June S.A.S. flew 1,866 passengers between Europe and New York, the highest figure the airline has yet recorded in one month on its trans-Atlantic service. The load factor was 99.6 per cent. During the first six months of 1949 S.A.S. carried 8,009 passengers to and from the United States.

* * *

Mr. Paul Goldsborough of T.W.A. has been appointed a director of International Aeradio, Ltd., in the place of Mr. F. L. G. de Keghel of Sabena who served for the statutory period of one year in accordance with the articles of the company. Mr. R. A. Gratz, also of T.W.A., will serve as an alternate to Mr. Goldsborough on the board.

* * *

The following is quoted from *The Right Road for Britain*, the Conservative party's statement of policy, under the heading of Civil Aviation: "For the full development of mercantile aviation, scope must be given to the pioneering spirit of free enterprise. We shall, therefore, review the structure of the Corporations and of the Ministry itself, so as to eliminate unnecessary functions and restore as wide a measure of private enterprise as possible."

* * *

Total route mileage for internal and international services operated by Australian airlines now amounts to 74,017 miles, over which 64,437 hours were flown in the first quarter of this year. During this period 404,748 passengers (a load factor of 71.8 per cent) and 405 tons of freight were carried. Guinea Airways, which operates over a number of short routes in South Australia had an average passenger load factor of 86.6 per cent, the highest of all Australian airlines.

* * *

Special lightweight electric fans have been supplied by the G.E.C. to T.C.A. for installation in North Star aircraft. Each aircraft is fitted with seven fans for cabin cooling.

* * *

On Tuesday of each week a stop will be made at Tangier on the Air France daily Skymaster service between Paris and Casablanca. The stop is for one hour on the outward and for 1½ hour on the inward flights.

* * *

Mr. Anson McKim, O.B.E., vice-president in charge of traffic for Trans-Canada Air Lines, recently arrived in London to represent that company at the civil aviation agreement talks between the Hon. Lionel Chevrier, Canada's Minister of Transport, and Lord Pakenham.

* * *

Trans-Canada Air Lines have appointed S. A. Canadian National Railways (France) as their agents for France and all French possessions in Africa. The agreement will enable T.C.A. and C. N. R (France) to offer greater facilities for travellers between botn countries.

* * *

The restaurant and cocktail lounge at Ringway has been taken over by the B.E.A. Catering Branch under contract for three years from the Manchester Corporation. B.E.A. also caters for the airline staff, visitors to Ringway and for its own services and those of K.L.M., Swissair, Air France and Aer Lingus. B.E.A has thus undertaken all catering at Northolt, Ringway and Renfrew.

* * *

As a result of recent decisions by the Council of I.C.A.O., the Airworthiness annexe to the International Convention on Civil Aviation permits contracting states to prescribe their own minimum rates of climb. The British Civil Airworthiness Requirements have consequently been amended to the effect that values prescribed for minimum rates of climb may be reduced by the Air Registration Board for particular cases after consultation with the applicant.

FROM THE CLUBS

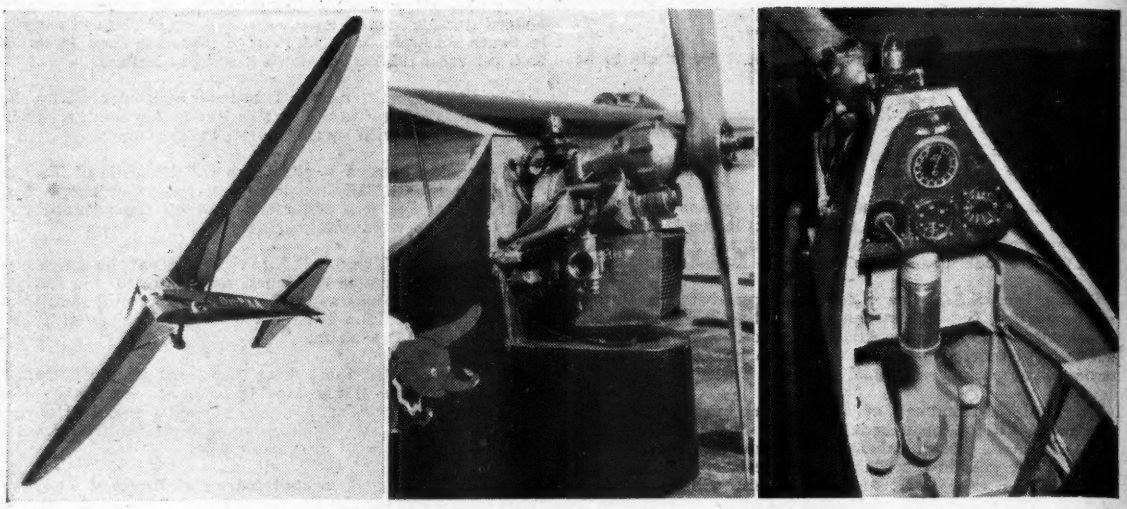
LT. B. C. G. PLACE, V.C., D.S.C., R.N., was the first member of the Royal Naval Flying Club at Gosport to fly solo, on July 24th. Seven members of the newly-opened club flew during that week-end, including Rear Admiral the Mackintosh of Mackintosh, C.B., D.S.O., D.S.C.

* * *

THERE are now some 400 members of the Airways Aero Club (formed by the British Corporations), including a considerable number of employees based overseas. Each flying member pays one guinea entrance fee, plus 1s 6d a week if serving in the U.K., and 1s a month if overseas. By such an arrangement overseas members, when on leave in this country, may fly the club aircraft at the normal rates. About 200 members who are based in and around London fly from Denham airfield where the club maintains two Hawks (converted Magisters), one Aeronca 100 and one Autocrat. At Whitchurch there are two more Hawks, another Aeronca and a Puss Moth, whereas the third branch of the club, at Hurn, has two Hawks, one Taylorcraft D (or Auster I) and one Aeronca 100. The Aeronca can be flown for £1 per hour and the other small aircraft for 30s per hour. Such low rates are possible only because maintenance is carried out by members of the club in their spare time on a voluntary basis. Instruction is also voluntary by members, although arrangements have been made to employ professional instructors for members at £2 per hour.

A REPORT of the work and progress of the Leicestershire Aero Club, Ltd., for the year ended March 30th, 1949, shows an excess of expenditure over income of £468 0s 4d. The loss really represents a subsidy from club funds of approximately £1 per hour beyond the cost of flying which otherwise would have been charged to members by an increase in the average rate of £3 per flying hour, as at present, to an average of £4 per hour. This is typical of the financial plight in which most flying clubs find themselves (through lack of official backing) and it is unlikely that any light aircraft club is at present able to show a profit over a financial year. During the year club aircraft were flown on 353 instruction

PUBLIC INTEREST: Visitors to London Airport on Sunday, July 24th were permitted to walk through the American Overseas Airlines' first Stratocruiser. Similar inspections were allowed at Shannon. Regular A.O.A. Stratocruiser services between London and New York are due to start on August 19th.



FINNISH BABY: Basically a Grunau Baby this experimental ultra-light aircraft is referred to in some detail on this page. On the left, the P.I.K.-10, as it is designated in Finland, is coming in to land with the airscrew stopped as is the normal procedure. In the centre can be seen the Aubier and Dunne 17 h.p. engine and on the right the simple cockpit lay-out. Instruments include an A.S.I., altimeter, turn and bank indicator and a cylinder-head temperature gauge.

Civil Aviation News . . . . .

flights, and 1,060 others including solos and cross countries. Eighteen pilots received ab initio training and qualified for their "A" licences, and 24 other pilots obtained "A" licence renewals. The flying time for the year was 448 hours on club aircraft, a total which was equalled by private owners on their own machines. Dual instruction was given by the honorary instructors, Messrs. B. V. Hewes, A. E. Coatman and F. D. H. Radford.

* * * *

CAMBRIAN AIR SERVICES, LTD., have bought the airfield at Pwllheli, Caernarvonshire, and club flyers and private owners will be glad to know that in future no landing fees will be charged. A nominal charge of 5s per aircraft for handling will be made to charter companies with one shilling added for each passenger embarking or disembarking. The entire local flying rights have been taken over from Butlins and there are already available one Rapide, an Auster and a Fairchild Argus for private hire or charter. The airfield is, of course, by the sea and surrounded by beautiful country which should appeal to those within range. Mr. Kenneth Davies, managing director of Cambrian Air Services, Ltd., hopes to form a flying club at Pwllheli, with the usual amenities, before the end of this season.

* * *

IN order to bring the rationing of aviation fuel for private flying into line with present allowances for motorists, owners of private aircraft who receive fuel for business will be able, with effect from May 1st, 1949, to draw in addition the "standard" allowance based on two hours flying per month. In future the standard ration will be included automatically with the business ration, if applications are appropriately endorsed. The standard allowance for private flying will be increased for the months of June, July and August to correspond with the "summer bonus" for private motor cars. In other words, the allowance will be doubled and granted on the basis of four flying hours per month for those months. Owing to the short notice which has been given the coupons will be valid beyond the end of August but special application for the double allowance should be made forthwith to the Ministry of Civil Aviation (Supply 2c), Tolcarne Drive, Pinner, Middlesex.

* * *

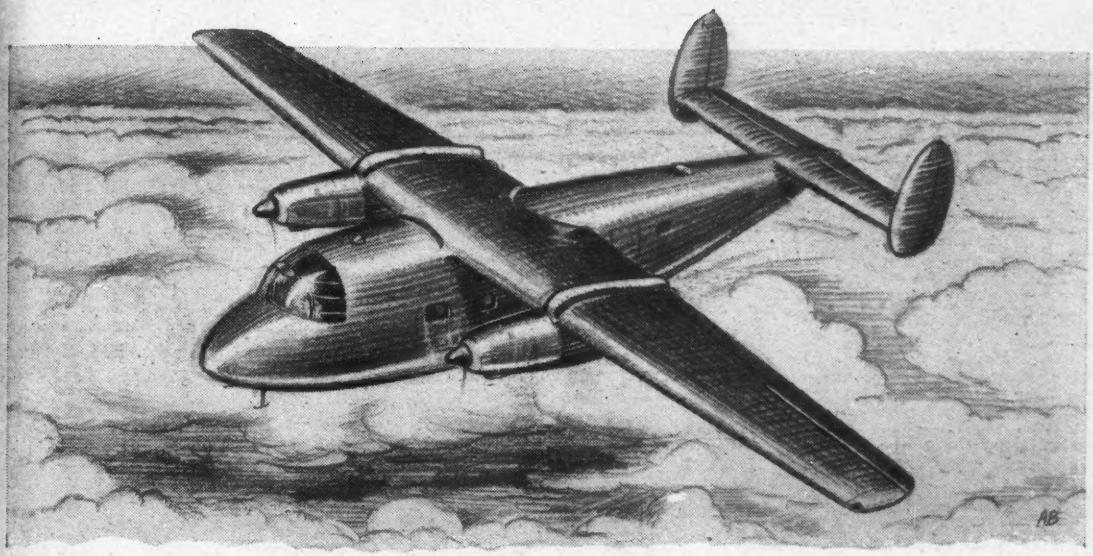
AN interesting experiment has been made in Finland in an attempt to produce an ultra-light aircraft or powered glider. The Finnish Technical University Flying Club (P.I.K.) recently modified a Grunau Baby sailplane and installed a 17 h.p. Aubier and Dunne V2D motor taken from a pre-war Pou de Ciel. Under the design number P.I.K.-10, but normally referred to as the Motor Baby, this light aircraft has completed some 15 hours flying and was recently seen being flown by members of the Helsinki Gliding Club. The specification is as follows: Span, 44ft 6in; length, 18ft 11in; height, 6ft 4in; empty weight, 457 lb; payload, 178 lb; loaded weight, 670 lb. The 17 h.p. engine has a speed of 4,000 r.p.m. and the two blade 28in pitch and 5ft 3in diameter airscrew is geared down to run at 1,600 r.p.m. Fuel consumption is 1.9 gall per hour; oil, 0.95 pints per hour. Cruising speed is reported to be 49.6 m.p.h.; maximum speed, 59 m.p.h.; landing speed, 34 m.p.h.; and rate of climb, 252 ft/min.

U.L.A.A. REPORT

AT the annual general meeting of the Ultra-Light Aircraft Association held recently, the president, Mr. Peter Masefield, said the requirement of 40 hours flying for a Private Pilot's Licence would promote the use of economical ultra-light aircraft and emphasize the necessity for having both two-seat and single-seat types. He stressed the need for great care and watchfulness on the part of all members in respect of safety since so much good work could be undone through accidents. He concluded by saying that the motto of the Association might well be "The Lord helps them that help themselves," and would the Minister of Civil Aviation please note.

G/C. E. L. Mole, chairman of the design sub-committee, disclosed that the Association had acquired two 5½ b.h.p. Zundapp ultra-light engines, one of which had been installed in the Zaunkoenig. It is an inverted four-cylinder in-line air-cooled engine of 1.98 metres capacity with a compression ratio of 6.2/1 and which weighs less than 150 lb. An English firm was interested in the manufacture of the engine in this country he said, and negotiations were in hand with the German manufacturers for production. G/C. Mole was hopeful that the required financial support would be forthcoming so that a 50 b.h.p. engine would at last be available. He also reported that Mr. D. E. Bianchi, manager of Personal Plane Services of Ashford, Middlesex, was building a ground trainer known as the Ladybird. This trainer had a span of only 15ft and although intended only for use on the ground it was controllable about all three axes. The prototype, powered by a 599 c.c. Harley Davidson motor cycle engine arranged as a tractor, operated safely up to speeds of 35 to 40 m.p.h. Mr. Bianchi hoped to supply the complete machine with A.S.I. and turn/bank indicator for less than £100. A resolution was passed at the meeting that the U.L.A.A. should draw up a design specification for an ultra-light two-seat trainer and use every endeavour to get the design undertaken and a prototype produced by a source other than the Association.

It is understood that the response to a suggested ultra-light rally and flying week-end has been poor. The dates have been fixed, however, for the week-end September 9th to 11th.



THE MAMBA MARATHON FLIES

Britain's Third Turboprop Transport Completed

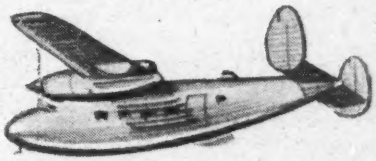
THE Handley Page Marathon, powered by Armstrong Siddeley Mamba airscrew-driving turbines, became Britain's third turboprop airliner to fly within twelve months when it took off from Woodley airfield, Reading, on July 21st. As a result, Britain finds herself in the unique position of having had three turboprop transports airborne before anyone else in the world has flown one.

The 22-seat M.69 Mamba Marathon is a direct development of the piston-engined Marathon airliner currently in production for the Ministry of Supply and British European Airways. It is basically the same except that it is powered by two Mamba turboprops each developing 1,010 h.p. and 307 lb of jet thrust.

Whereas the Hermes V fills the need for a large turboprop airliner, and the Viscount and the Apollo for a medium-sized type, the Marathon is small and much cheaper to buy and therefore opens up the market to feeder airlines and even, perhaps, to charter companies. It has been specially designed and built—through the backing and foresight of the Ministry of Supply—for journeys requiring a still-air range of up to 770 miles.

As the production lines of Handley Page turn out standard Gipsy Queen-powered Marathon airliners for B.E.A., and 82,000 lb Hercules-engined Hermes IVs for B.O.A.C., their experimental departments are busy developing and perfecting the Mamba Marathon and the Hermes V. Consequently, should the airlines later elect to replace or augment their present new equipment with turboprop aircraft now in the experimental stage, the country will be saved a large amount of money because both piston and turboprop variants of these two types of aircraft are identical, except for their engine installations. Not only can the Mamba Marathon and the Hermes V be built on the same jigs and with the same tools as are used to construct the earlier marks now in production, but the airlines may effect an economy because they will only need to train their ground crews to deal with new engines, and will not have to spend hundreds of pounds in converting their aircrews to an entirely new aircraft. A description of Marathon progress appeared in the May 17th issue of *Flight*.

More than three years have been spent on the design and construction of the Mamba Marathon, but its initial flight was seriously delayed by the troubles which befell the designers — the late Miles Aircraft, Ltd. The Marathon has a thin wing so the jet pipe of the Mamba engine cannot be buried within the aerofoil section; consequently it must be carried—not very attractively—over the top of the wing. To test the aerodynamic effects this installation would have, a 5/6th scale nacelle was built some time ago of plywood and fitted to the wing of an Aerovan. This Aerovan (actually the prototype) was extensively flown and the data accumulated was ultimately used to advantage.



New Performance Standards

Flying at 10,000ft, the Mamba Marathon will cruise at 260 m.p.h. and if it were used on the British European Airways' internal services, it could cut travelling time by about one half. Calculations show a take off in 700yd and climb-away at 2,100ft a minute. Should one engine cut when the take-off run is well advanced, the climb will still be 600 ft/min. The calculated service ceiling of the Mamba Marathon is 35,000ft, and on one engine it is 16,000ft. Consequently, if advantage is to be taken of performance at high altitudes, production versions would have to be pressurized. Designs have been prepared for cabin pressure with maximum differential of 2½ lb/sq in.

Normal still-air range is 770 miles and the maximum still-air range is 900 miles. It is said that the Mamba-powered Marathon would be able to compete economically with the Gipsy Queen version. It will carry 18 passengers and 540 lb of luggage for 770 miles at 260 m.p.h. as compared with its forerunner's 500 miles at 175 m.p.h. with the same load. For a distance of 500 miles the Mamba Marathon could carry 22 passengers and over 1,000 lb of luggage or freight. As a freighter it could carry 5,470 lb for 500 miles, or 4,370 lb for 770 miles. Having over

The Mamba Marathon Flies . . . . .

1,000 cubic feet of cargo space it would be especially useful for carrying goods of low density.

The main passenger cabin is 18ft in length, 7ft 9in wide and from 6ft to 6ft 9in high. Nine windows, each 19in by 13in give passengers a clear and uninterrupted view of the underlying scenery. The whole cabin is air conditioned and the inside temperature is thermostatically controlled. Temperature inside the cabin can be maintained at 65 deg F, when outside temperature is −15 deg F; alternatively, cool air can be provided in hot weather. Because of the much reduced sound and vibration they produce, turboprops have pleased everyone who has flown behind them. These desirable characteristics should be even more apparent on the Marathon as the wing is completely sealed off from the fuselage.

The arrangement of the cockpit will earn special praise from those who use it. It has the normal side-by-side seats, and full dual control is fitted; pilot and co-pilot between them look after such radio and navigational duties as are necessary on short-route flying. The pilots enjoy excellent visibility—they can see the ground 16ft in front of them and look around for 210 deg.

A high coefficient of lift is obtained from the Miles retractable auxiliary aerofoil flaps. On the four-engined Marathon the flap-operating mechanism is installed in the rear of each engine nacelle. Because the Mamba Marathon has only two nacelles a fairing containing the flap mechanism, shaped like a Brazil nut, is fitted near the trailing-edge in place of the outboard engine nacelle fairing.

Airlines at home and overseas are expressing the keenest possible interest in Britain's large and medium turboprop airliners because they know that eventually they will have to have such aircraft and that there is no one else to whom they can turn for such modern equipment. This is a great opportunity for the British export market. J. S. W.

THE 47th ENTRY PASSES OUT

"Father" of the Royal Air Force Reviews the Cranwell Cadets

Illustrated by Flight Photographs

ON Wednesday of last week, July 27th, Marshal of the Royal Air Force Lord Trenchard was the reviewing officer at the passing-out parade of the 47th entry into the Royal Air Force College, Cranwell. It was as a result of Lord Trenchard's inspiration that the college was founded in 1920, and he last took the salute at a passing-out parade 13 years ago.

On his arrival by car, the First Marshal was greeted by A. Cdre. G. R. Beamish, Commandant of the College, who was accompanied by Lord Tedder, Chief of Air Staff, Air Chief Marshal Sir Ralph Cochrane, A.O.C.-in-C., Flying Training Command, and G/C. R. G. Seymour, Assistant Commandant, Digby Wing. (G/C. Seymour will shortly leave for another appointment and G/C. D. Lumgair will take his place.)

The weather was thundery and oppressive; nevertheless the parade was as smart as only a Cranwell parade can be. Timing was perfect and in the extremely difficult "Advance in Review Order" the squadrons' dressing remained perfect. The King's Colour, presented by His Majesty a year ago, was paraded in a most impressive manner and preceded the Senior Term Cadets as they marched off parade and up the steps of the College for the last time. The parade was watched by many of the cadets' parents and

Marshal of the Air Force Lord Trenchard presents the Sword of Honour to Flight Cadet Under-Officer W. J. Herrington, who also won the Air Ministry Prize for Imperial and War Studies.

The Cranwell Flying Wing in review order. On parade were 12 Prentices, 3 Ansons and 12 Harvards. In the background can be seen the personal aircraft of visiting senior officers.

a large and distinguished gathering of officers from all three services, and their ladies.

Lord Trenchard is an example to reviewing officers in his thoroughness. He stopped to speak to most of the senior term cadets and to a number of the juniors also. He seemed completely tireless. From the parade he went straight down to the Flying Squadron and inspected that with the same scrupulous care. For everyone to whom he spoke there was the old quick smile and a word of interest and encouragement.

At the close of the inspection the guests assembled in the College gymnasium to witness the prize-giving, preceded by the Commandant's address. A. Cdre. Beamish, after voicing everyone's pleasure at seeing Lord Trenchard present, went on to speak of the college and the present entry. "In 1936," he said, "the strength of the college was 130 cadets, and this number rose to a pre-war peak of 161 in 1938. To-day there are in residence 176 Flight Cadets." He hoped that before long the planned figure of 240 would be reached.

"Our most recent commitment," went on the Commandant, "is the Equipment and Secretarial Wing at Digby where, for the first time, cadets who aspire to permanent commissions in ground branches are trained along lines similar to those at Cranwell."

Referring to the quality of the 47th entry, A. Cdre. Beamish said: "One important difference only lies between them and their predecessors, namely that they had not to submit to the rigours of a written examination before entry, but were certified as intelligent by their headmasters. To our regret some members of the entry have been found unsuitable to continue the course, while some others have barely reached a standard which can be considered adequate. But let me hasten to add that at the other end of the scale there have been some brilliant performances and apart from those who are recognized by award of prizes, I wish particularly to commend F/C. Cpl. Waudby for his excellent attainments in Imperial and War Studies and F/C. Hemming in Aero-Science and Engineering."

A corner of the distinguished visitors' enclosure. Lady Trenchard can be seen in the foreground between Lord and Lady Tedder.

PRIZEWINNERS

Sword of Honour	F/C. Under-Off. W. J. Herrington
King's Medal	F/C. Under-Off. T. R. Gush
Philip Sassoon Memorial Prize	F/C. Sgt. D. Wright
Robert Marsland Groves Memorial Prize	F/C. Sgt. G. K. Mossman
Dickson Trophy	F/C. Cpl. R. G. Price.
John Anthony Chance Memorial Prize	F/C. Sgt. N. Chamberlain.
Abdy Gerrard Fellowes Memorial Prize for Aeronautical Science	F/C. Under-Off. T. R. Gush.
Air Ministry Prize for Imperial and War Studies	F/C. Under-Off. W. J. Herrington.
Royal United Services Institution Award	F/C. Cpl. C. H. Walker.

Lord Trenchard stops to talk to a Cadet during his tour of the Squadron drawn up for inspection.

He concluded by mentioning that very late in their training the cadets were somewhat staggered to learn that they were all required to graduate with white card instrument ratings. After a quick recovery from the shock, all, except one, qualified for this high standard.

At the conclusion of the Commandant's speech Lord Trenchard presented the prizes, and in an address to the cadets congratulated them on the morning's parade. "Good parades," he said, "show a happy station and foster the team spirit."

Speaking of the international situation he showed (on maps produced for the occasion) the strategic splitting of the world into hemispheres, one of which had 94 per cent of the production. Britain, he claimed, was the centre of this hemisphere. His final injunction—given with all the enthusiasm of the old "Boom"—was: "Believe in yourselves, believe in the Service. Let each one do his utmost in his particular job and make that efficient. Without that you can do nothing. With that you can do anything."

H. V. ROE

WITH regret *Flight* records the death of Humphrey Verdon Roe, a pioneer of Britain's aircraft industry. He was the third son of the late Dr. E. H. Roe.

From 1909 onward he financed his brother Alliott (now Sir Alliott Verdon Roe) and helped to found the famous Avro concern, of which he was the managing director until 1917, when he joined the Royal Flying Corps. He was badly wounded while on night bomber operations and the spinal injuries he sustained affected him for the rest of his life. In 1918 he married Dr. Marie Stopes.

CORRESPONDENCE

The Editor does not hold himself responsible for the views expressed by correspondents. The names and addresses of the writers not necessarily for publication, must in all cases accompany letters.

VIEW FOR ALL PASSENGERS

Drawbacks of Three Abreast Arrangement

IN the July 14th issue of *Flight* there is a drawing showing two suggested arrangements of seating for the Vickers Viscount 700. I see that in one of these there are three seats abreast on one side of the centre gangway and two on the other. It is to be hoped that it is not found necessary to adopt this arrangement, as I cannot imagine anything more disappointing to a passenger who enjoys an air journey, than to find himself (or herself) in the inner of the three seats, from which there could be nothing to see but the interior of the cabin. It is difficult enough in any low-wing monoplane to find a seat with a view, but this would make it worse.

I know that it is desirable to carry as many passengers as possible in order to give a good payload, but, if this seating layout is to be adopted it would be an advantage if particular seats could be reserved at the time of booking but, perhaps, there would be difficulties from the point of view of trim when the load was light. D. B. PARKINSON.

Esher.

DONKEY TO DAKOTA

Confusion in State of Greek Airlines Denied

AS one who is associated with one of the two major Greek airline companies, Hellenic Airlines, I was very pleased to see *Flight* taking an interest in the development of Greek civil aviation, as portrayed by Mr. Rumbelow's article in the issue of July 21st.

It would seem, however, that Mr. Rumbelow must have obtained his information from rather limited sources, which have not been altogether accurate and I should like to correct some false impressions which the article might otherwise create.

Hellenic Airlines is a Greek company in which Scottish Aviation is a minor shareholder to the extent of 40 per cent of the capital, so it is quite incorrect, therefore, to describe Hellenic Airlines as a subsidiary of Scottish Aviation.

This error in Mr. Rumbelow's article is unfortunate both from the point of view of the British interest in Hellenic Airlines and even more so from the point of view of the major Greek interest, which is that of the Pension Funds of the Greek Army, Navy, Air Force and Civil Service, in which the Greek Government is interested and also a large cross-section of the Greek people, who are pensioners or contributors to these funds.

Mr. Rumbelow's reference to Hellenic Airlines having 70 per cent British crews would also be misleading without the following explanation. Hellenic Airlines, very wisely I think, adopted British standards of air crew selection, training, flying regulations and aircraft maintenance, and this has been reflected in the regularity and efficiency of their air services from the commencement.

It necessitated, however, utilizing a fairly high percentage of British crews for the first few months of operation and this was rapidly reduced as selection was made from the excellent Greek material and Greek air and ground crews were trained and tested to British standards.

As far as I am aware, there is no cut-throat competition or confusion in the Greek network of air services as, when Hellenic Airlines entered the field, it did so with precisely the same number of Dakotas and the same fares as the only other company in Greece at that time. Also it was within the powers of the Greek Government to control the size of the fleets of either company by the granting or otherwise of import licences for new aircraft, and, in fact, so far only one new Dakota has been added to the Hellenic Airlines' fleet.

Nevertheless Hellenic Airlines has proved to be a successful airline company and showed a profit in its first year of operation, and is now operating a wide network of services throughout Greece in addition to operating twice weekly to Paris, London, Alexandria, Cyprus and Lydda. A considerable expansion of the company's internal air services is now under way, which should be of real advantage to the Greek people and their internal trading, and the foreign revenue being earned by the company's external air services and the present expansion of these is assisting the Greek balance of trade.

I am sure you will agree with me that this information refutes the statement in Mr. Rumbelow's article to the effect that air transport in Greece would appear to be approaching a state of hopeless confusion. The British interest in Hellenic Airlines has every reason to believe that the Greek Government and its American aviation advisers are fully capable of regulating competition in ways which will guarantee to the Greek people the benefits of genuine competition.

Scottish Aviation, Ltd., Prestwick. D. F. McINTYRE.

DIM MEMORIES

Was it the Piffard ?

THE pioneer aircraft referred to by Mr. W. J. Smith in your issue of July 14th may have been the "Piffard." Its designer and builder was one of the many residents of the artistic colony living at Bedford Park at the turn of the century. The aircraft components were built in the studio and most other rooms of the house, to the great detriment of Mr. Piffard's more usual occupation.

The first efforts to fly were made in the locality referred to, but the results at no time caused the pilot any embarrassment by compelling him to attempt a landing. Mr. Piffard decided that an aerodrome of unlimited area was the pre-requisite of safely becoming airborne, so he transported his creation to Shoreham and mounted it on pontoon floats.

The small measure of success attained off the Sussex coast did not encourage Mr. Piffard indefinitely to continue his experiments, so that ultimately he abandoned the project and returned to the less hazardous and certainly more profitable method of expressing his flights of fancy on canvas.

Shorwell, Isle of Wight. FRANCIS KAPPEY, A.F.R.Ae.S.

MORE DIM MEMORIES

Yolks for Power Egg Lubrication

YOUR correspondent asks about an aircraft flown from a wooden runway at Hanger Hill, Ealing, 1908-1909. I was living in Ealing at the time and the only aircraft I remember was flown from a stupid little airfield nearby on a sleeper runway at the W. Ealing Flying School just off the present Western Avenue. The aircraft in question may have been the Graham White "Omnibus" at a much later date. Another Ealing mystery aircraft was the Russian triplane supposed to be stationed at Northolt in 1916. Its size, according to rumour, would have made the Brabazon look like a house-fly; its purpose was said to be the kidnapping of the Kaiser. During an egg shortage a rumour was spread that its engines were lubricated with yolks of thousands of new laid eggs, and one often met people whose "uncle's cousin" was in the R.F.C. beating up eggs day and night. CHARLES NICOLLAS.

Uxbridge.

R.Ae.C. AVIATORS' CERTIFICATES

RECENTLY, reviving a pre-war practice, we published a list of Aviators' Certificates as issued from time to time by the Royal Aero Club. A further list, covering Certificates issued between June 7th and July 1st, is given below:—

No.	Name	Club or School	Date
26,023	Clive William Turner	No. 7. F.T.S.	7.6.49
26,024	Malcolm Morrison Young	"	7.6.49
26,025	Philip Frederick Gurdon	Qualified Service pilot	9.6.49
26,026	Raja/Brajendra Singh Deo	London Aero Club	13.6.49
26,027	Arthur Elliott Lee	Qualified Service pilot	13.6.49
26,028	Rex Shilton	"	13.6.49
26,029	James William Haggas	"	13.6.49
26,030	Dennis George Stafford	"	13.6.49
26,031	David Frederick Ogilvy	"	13.6.49
26,032	George Charles Ransom Morris	Fair Oaks Flying Club	13.6.49
26,033	Cecil Alan Tomlinson	Qualified Service pilot	15.6.49
26,034	Frederick William Chapman	Current "A" Licence	13.6.49
26,035	Philip Francis Robinson	Qualified Service pilot	15.6.49
26,036	John Norman Dennis	"	15.6.49
26,037	William Joseph Stevens	Rochester Flying Club	17.6.49
26,038	Geoffrey Warren Hall	Lancashire Aero Club	23.6.49
26,039	John Barter Davies	Cardiff Aero Club	23.6.49
26,040	Peter Roland Cope	Qualified Service pilot	28.6.49
26,041	Jack Edmund Watts	"	28.6.49
26,042	Alan Colin Maclachlan	"	29.6.49
26,043	Har Dayal Singh	Air Service Training Ltd.	29.6.49
26,044	John Ernest Bright	Qualified Service pilot	29.6.49
26,045	Frank Campbell Sturdy	"	29.6.49
26,046	Edward Reed	Newcastle Aero Club	1.7.49

SERVICE AVIATION

FOR TEACHING TEAMWORK: The new Vickers-Armstrongs Varsity T.1 advanced trainer (2 Bristol Hercules engines), some notes concerning which appear on this page. The underslung structure houses the bombing instructor and pupil.

R.A.F. Re-equipment

THERE is good news of progress now being made in the re-equipment of R.A.F. squadrons overseas. Jet fighters have replaced piston-engine types in a number of units: three of the fighter squadrons in Germany, for example, now have D.H. Vampire 5 fighter-bombers, and squadrons in Malta and Cyprus are armed with the earlier Vampire 3. Bristol Brigand twin-engined dive bombers are serving in Iraq and will re-equip squadrons at Aden, Kuala Lumpur (Malaya) during the next two months. A meteorological flight of Brigands has been formed at Negombo, Ceylon. Vickers Valettas have started to replace Dakotas.

Flying Training Conference

THE annual conference of Flying Training Command, R.A.F., was held at R.A.F. Station, Manby, Lincs, from July 25th to 26th. Discussion bore on the problem of training pilots and navigators to the standards required by new types of aircraft now being designed, and included a study of the methods of achieving high-quality training for the minimum expenditure of resources. The conference was under the chairmanship of the Commander-in-Chief, Flying Training Command, Air Chief Marshal The Hon. Sir Ralph A. Cochrane; the Commanding General of the American Air Training Command (Major General R. W. Harper), the Deputy Commanding General of the Flying Division of the American Air Training Command (Brigadier General B. E. Gates), and Vice-Admiral Sir Reginald Portal, Flag Officer (Air) (Home), attended, as well as representatives from the Air Ministry and the R.A.F. operational commands.

Royal Air Force and Naval Aviation News and Announcements

Vickers Varsity

A PHOTOGRAPH on this page of the new Vickers-Armstrongs Varsity T.1 advanced trainer shows that the type differs appreciably from the Valetta, from which it was developed. The tricycle undercarriage comprises a steerable twin nose-wheel and twin-wheel main oleos.

In the one aircraft, without conversion, facilities are available for training in air navigation/bomb aiming, piloting, and radio/radar technique. The dual-control flight deck accommodates the two pilots, navigator and radio operator. An underslung, pannier-like structure contains prone positions for the bomb aimer and his pupil.

LEARNING ON THE LIFT: Five officers of the Royal Netherlands Air Force having been studying Air Lift operations at Gatow; four are seen with their hosts. From left to right are Capt. P. W. Brockmeyer, Lt. Col. R. Collier, Capt. H. J. Doornbes, Major A. J. M. Groot, Major A. B. Wolff and G/C. Yarde.

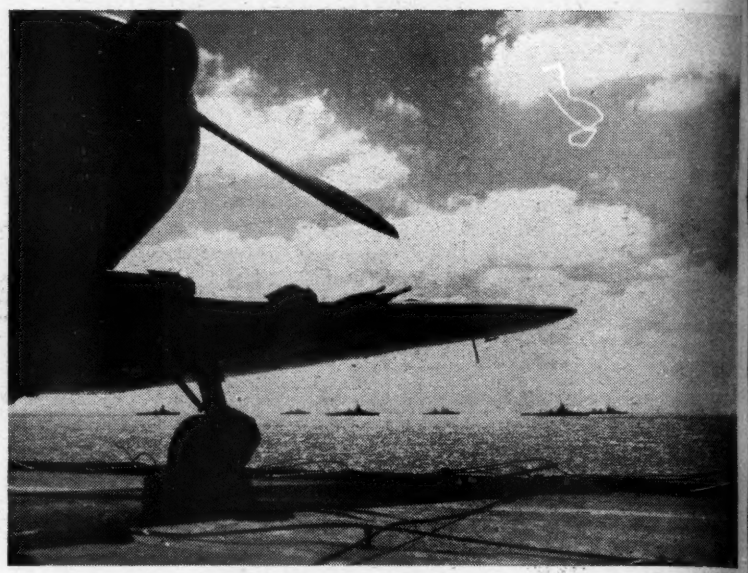
Courier Ceremony

BETWEEN April, 1946, and May, 1949, when the route was taken over by Malayan Airways, Ltd., the R.A.F. was the only air link between Singapore and Borneo. Their courier service, with ports of call at Kuching (Sarawak), Labuan (an island at the entrance to the Gulf of Brunei), and Jesselton, the capital of British North Borneo, has been operated for the entire period by the Sunderlands of No. 209 (Hong Kong) Squadron, first under the command of W/C. L. M. Lawes, and for the last two years under S/L. P. R. Hatfield, D.F.C. During this period the Sunderlands have flown 143 round trips, with a total of 2,450 flying hours, and 368,000 nautical miles, and have carried 7,000 passengers and 268,000 pounds of freight and mail. Notable passengers included Mr. Malcolm MacDonald, the Commission General for the U.K. South-East Asia, Lord Listowel, the Minister of State for Colonial Affairs, Lord Killearn, Special Commissioner for South-East Asia, Sir Francis Twining, the former Governor of North Borneo, and the Sultan of Brunei.

At the invitation of the residents of

Service Aviation . . . . .

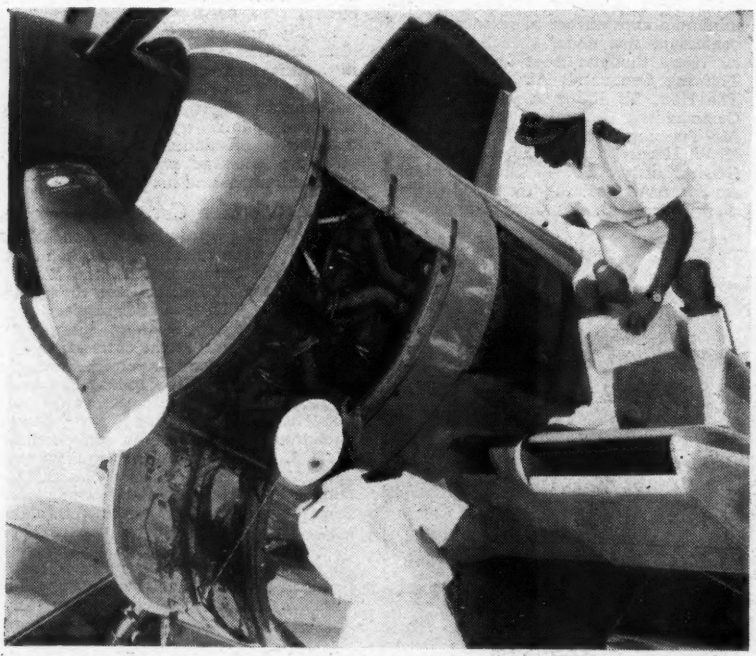
Jesselton during June, 20 aircrew and ground-crew members of the squadron, together with the Air Officer Commanding, Malaya, Air Vice-Marshal F. J. W. Mellersh, flew to the capital for a farewell two-day stay. A.V-M. Mellersh was a member of the original 209 Squadron when it was formed from No. 9 Squadron, R.N.A.S., in 1918. The programme began with a football match between a representative Jesselton XI and the squadron team. The squadron won by three goals to one. In the evening the entire European community entertained the R.A.F. party at the Jesselton Sports Club, when the Squadron Commander presented the club with a hand-carved lacquered replica of the 209 Squadron crest. The following day Jesselton teams played and defeated the squadron teams at cricket and football. In the evening the Officer Administering the Government, Mr. Calder, presented to S/L. Hatfield on behalf of the communities of British North Borneo, an ancient Malay sword and scabbard known as a parang gayang —ornamented with four thick tufts of human hair and a number of Argus pheasant feathers. The hilt is made of carved bone and the blade is engraved for the greater part of its length. Mr. Calder also handed over a cheque for 1,000 dollars to buy a sailing dinghy for the use of the squadron. This had been subscribed by all the local inhabitants, in addition to the British, in gratitude for the squadron's work during the previous three years. Accepting the gifts with thanks, S/L. Hatfield presented to the Jesselton Sports Club a scale-model Sunderland complete with the name *Api-Api*, the local name for Jesselton. Air Vice-Marshal Mellersh, in a short speech, hoped it would be possible to maintain the squadron's association with the colony.



THE BAY AT ITS BEST : A Blackburn Firebrand T.F.5 (Bristol Centaurus) figures prominently in this sunny study, from H.M.S. "Implacable," of cruisers in the Bay of Biscay during the recent manoeuvres.

A.T.C. Gliding Instructors

A.T.C. gliding instructors are to have the opportunity to receive standardized training on two-seater gliders so that they may be better qualified to train cadets up to the solo-circuit stage. Training will be given at a central school run by the R.A.F. at R.A.F. Station, Detling, near Maidstone, Kent. Instructors may go there for one or two weeks at a time, whenever they leave their normal occupations. To help those unable to visit Detling, staff instructors from the school will occasionally visit gliding schools at week-ends to regrade instructors. The grading scheme is being revised to provide a clearer indication of ability, and to give instructors a more definite aim. This should result in a higher gliding standard throughout the A.T.C.



SEALED AND DELIVERED : Commander James Sholto Douglas, R.N., D.S.O., Commander (Air) at R.N.A.S., Hal Far, Malta (right), supervises examination of the engine seals on one of four Sea Furies which, as recorded in "Flight" of July 28th, were delivered to Malta in record time.

R.Aux.A.F. and V.R. for London

UNITS of the Royal Auxiliary Air Force and the Royal Air Force Volunteer Reserve are to come to Central London. These are to be a new Reserve Centre, which will probably open in September; a town headquarters for No. 604 (County of Middlesex) Squadron, R.Aux.A.F.; and a town headquarters for No. 3604 (County of Middlesex) Fighter Control Unit, with facilities for operational training. The Reserve Centre, equipped with an officers' and airmen's mess and lecture rooms, will open at 77, Hallam Street, W., and will recruit up to 3,000 officers and airmen for ground trades. Additional lecture rooms will be available at No. 61, New Cavendish Street, W., for aircrew training. Further details of this will be announced later. Town Headquarters of No. 604 Squadron and No. 3604 F.C.U. will be at No. 17-19, Queen Square, W.C. All three buildings were previously occupied by Air Ministry, and the units will move in as soon as building alterations are complete.

No. 2600 (City of London) Light Anti-aircraft Squadron, formerly known as No. 2604 (County of Middlesex) L.A.A. Squadron, and based at R.A.F. Stanmore, has already opened a town headquarters at Finsbury Barracks, E.C. Operational training for this unit is to continue at R.A.F. Stanmore.

The new Reserve Centre will bring the total in the country up to 25.

ninently
ring the

Station,
Instruc-
wo weeks
ave their
those un-
structors
ally visit
o regrade
e is being
ndication
rs a more
sult in a
hout the

London

liary Air
ir Force
o Central
Reserve
n in Sep-
r No. 604
quadron,
dquarters
liddlesex)
ilities for
e Centre,
airmen's
en at 77,
ecruit up
r ground
ns will be
Cavendish
g. Fur-
nnounced
No. 604
. will be
V.C. All
occupied
will move
tions are

ght Anti-
known as
) L.A.A.
F. Stan-
wn head-
ks, E.C.
nit is to

bring the